EFFECTS OF A CAREER COURSE ON STUDENTS' CAREER DECISION-MAKING SELF-EFFICACY, INDECISION AND DIFFICULTIES

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ABSTRACT

Many college students have difficulties deciding on a major or field of study at university. Hartman, Fuqua and Hartman (1983) reported that if undecided students did not receive help, they were more likely to drop out of school and to be unhappy with their eventual choice of career. Furthermore, undecided students may make poor career and academic choices which will impact their future (Gati, Krauz & Osipow, 1996; Fouad, Cotter & Kantamneni, 2009). While the need for career interventions has increased (Fouad et al., 2009; Reese & Miller, 2010), few studies have systematically evaluated the impact and outcomes of career interventions designed to reduce career indecision. In addition, the majority of studies were conducted on Western populations thereby restricting the generalisability of findings across cultures. Therefore, there is a need to investigate whether theory-based interventions that have shown positive outcomes on Western samples can be applied in a Southeast Asian context. This study aims to address this gap in research literature through examining the effects of an intervention to help Malaysian students increase their career decision-making self-efficacy, and reduce career indecision and career decision-making difficulties. This thesis describes the research work aimed at evaluating the effectiveness of a career course designed to help students make career decisions in a Southeast Asian context. It details the quasi-experimental longitudinal intervention utilising intervention and comparison groups that was carried out with first-year Malaysian college students. Participants in both groups were given questionnaires assessing career

decision-making self-efficacy, career indecision and career decision-making difficulties at various time points. Results indicated that participants in the intervention group upon completion of the course experienced increased career decision-making self-efficacy and reduced career indecision. Participants in the intervention group also showed an overall decrease in career decision-making difficulties but further investigation revealed that the decrease was non-significant in one subcategory of difficulties, namely difficulties related to the lack of motivation. The implications of these findings are discussed in terms of existing literature and suggestions for further research are also included.

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TABLE OF CONTENTS

	Page no.
ABSTRACT	1
ACKNOWLEDGEMENTS	3
PREFACE	17
LIST OF TABLES	21
LIST OF FIGURES	24
LIST OF ABBREVIATIONS AND ACRONYMS	27
CHAPTER 1 – INTRODUCTION	
1.1 Chapter overview	29
1.2 General statement of the problem area	29
1.3 Malaysia: a brief history, demographics, economic activities and education system	32
1.4 Significance of the study	37
1.5 Chapter summary and conclusions	43
CHAPTER 2 – CAREER DECISION-MAKING: A REVIEW OF LITERATURE	
2.1 Chapter overview	45
2.2 Career decision-making	47
2.2.1 Model of career decision-making	48
2.2.2 Career decision-making styles	52
2.3 Career indecision	55
2.3.1 Correlates of indecision	59
2.3.2 Assessing career indecision	61

2.4 Career decision-making difficulties 65

2.5 Career decision-making self-efficacy 72

2.6 Chapter summary and conclusions 80

CHAPTER 3 – CAREER INTERVENTIONS: A REVIEW OF LITERATURE

3.1 Chapter overview 81

3.2 Career interventions 81

3.2.1 Brief interventions 86

3.2.2 Use of career assessment tools 88

3.2.3 Computer-assisted career guidance systems 90

3.2.4 Longer interventions 93

3.2.4.1 Relationship between CDMSE and career Indecision 95

3.3 Critical components of career interventions 101

3.4 Career courses 103

3.4.1 Courses to reduce career indecision 105

3.4.2 Courses to enhance CDMSE and to reduce decision-making difficulties 107

3.5 Gender, career indecision, decision-making difficulties and CDMSE 110

3.6 Summary 113

3.7 Research aims 115

3.8 Research questions and hypotheses 117

3.8.1 Research question one (RQ1) 117

3.8.2 Research question two (RQ2) 118

3.8.3 Research question three (RQ3) 118

3.8.4 Research question four (RQ4) 119

3.8.5 Research question five (RQ5) 119

3.9 Chapter summary and conclusions 119

CHAPTER 4 – RESEARCH DESIGN AND METHODOLOGY

4.1 Chapter overview 120

4.2 Rationale for the research design and methodology 120

4.3 Participants 128

4.3.1 Sampling strategy 129

4.3.2 Sample size requirements 131

4.3.3 Description of participants 133

4.4 Main instruments 136

4.4.1 Career Decision Scale 137

4.4.2 Career Decision Difficulties Questionnaire 139

4.4.3 Career Decision Self-Efficacy Scale – Short Form 143

4.4.4 Revision to items on two instruments 146

4.4.5 Inclusion of validity items 148

4.5 Feedback form and email interviews 149

4.6 Procedure 150

4.6.1 Data collection procedure for the main instruments 152

4.6.2 Data collection procedure for feedback form and email interviews 154

4.7 Data analysis procedure 155

4.7.1 Data from questionnaires 155

4.7.2 Data from feedback forms and email interviews 156

4.8 Ethical issues 156

4.8.1 Voluntary nature of the study 157

4.8.2 Privacy and confidentiality 157

4.8.3 Informed consent 158

4.8.4 Deception and harm to participants 158

4.8.5 Debriefing of research participants 158

4.9 Chapter summary and conclusions 159

CHAPTER 5 – CAREER COURSE AS INTERVENTION

5.1 Chapter overview 160

5.2 Theoretical foundations 160

5.3 Critical intervention components 163

5.4 Course objectives 164

5.5 Length of course 165

5.6 Techniques, activities and materials 166

5.7 Course content and description 167

5.7.1 Session 1: My identity and motivation 168

5.7.2 Session 2: The world of work 170

5.7.3 Session 3: Targets and plans 171

5.7.4 Session 4: Problem-solving and decision-making 173

5.8 Integration of Bandura's four sources of information 174

5.9 Integration of Brown and Ryan Krane's five critical components 176

5.10 Chapter summary and conclusions 180

CHAPTER 6 – INVESTIGATION INTO THE FACTOR STRUCTURE OF MAIN INSTRUMENTS

6.1 Chapter overview 181

6.2 Career Decision Self-Efficacy Scale – Short Form (CDSES-SF) by Betz et al. (1996) 182

6.2.1 Method for analysing the CDSES-SF

6.2.1.1 Participants 185

6.2.1.2 CDSES-SF 185

6.2.1.3 Preliminary analysis of the CDSES-SF 186

6.2.2 Factor analytic procedures for the CDSES-SF 187

6.2.3 Results for the CDSES-SF

6.2.3.1 Stage one: Testing the five-factor structure using CFA 188

6.2.3.2 Stage two: EFA to estimate number of factors 190

6.2.3.3 Stage three: Testing alternative measurement models with CFA 192

6.2.4 Discussion on the CDSES-SF 195

6.3 Career Decision Scale (CDS) by Osipow et al. (1976) 197

6.3.1 Method for analysing the CDS

6.3.1.1 CDS 199

6.3.1.2 Preliminary analysis of the CDS 200

6.3.1.3 Model specification for the CDS 200

6.3.2 Results for the CDS 201

6.3.3 Discussion on the CDS 204

6.4 Career Decision Difficulties Questionnaire revised version (CDDQr) by Gati and Saka (2001b) 206

6.4.1 Method for analysing the CDDQr

6.4.1.1 CDDQr 209

6.4.1.2 Preliminary analysis of the CDDQr 209

6.4.2 Results for the CDDQr 210

6.4.3 Discussion on the CDDQr 212

6.5 Chapter summary and conclusions 213

CHAPTER 7 – PILOT STUDY

7.1 Chapter overview 217

7.2 The current investigation 217

7.2.1 Research questions and hypotheses 219

7.3 Method

7.3.1 Research design 222

7.3.2 Participants 223

7.3.3 Instruments 225

7.3.4 Procedure 226

7.4 Results

7.4.1 Attrition analysis 228

7.4.2 Impact of intervention on CDMSE 228

7.4.3 Impact of intervention on career indecision 230

7.4.4 Impact of intervention on career decision-making difficulties 231

7.4.5 Relationship between CDMSE and career indecision 233

7.4.6 Relationship between CDMSE and career decision-making difficulties 234

7.4.7 Gender and interventions 235

7.5 Discussion of findings 237

7.6 Feedback on research design process 240

7.6.1 Timing and instruments 240

7.6.2 Attrition rate, recruitment and retention strategies 241

7.6.3 Modifications to intervention 242

7.6.4 Changes to feedback form 243

7.7 Chapter summary and conclusions 244

CHAPTER 8 – IMPACT OF INTERVENTION ON CDMSE, CAREER INDECISION AND DECISION-MAKING DIFFICULTIES

8.1 Chapter overview 245

8.2 The present investigation 245

8.3 Main instruments 246

8.3.1 Preliminary analyses

8.3.1.1 Use of parametric tests 247

8.3.1.2 Equivalence of data from participants 249

8.3.1.3 Attrition analysis 252

8.3.1.4 Reliability analysis 252

8.4 Research question two 254

8.4.1 Impact of intervention on CDMSE 255

8.4.1.1 Testing of assumptions for mixed ANOVA 255

8.4.1.2 Results for mixed ANOVA for interaction effects of time and group on CDMSE for intervention and comparison groups at Time 1 and Time 4 256

8.4.1.3 Results for mixed ANOVA for interaction effects of time and group on the four subscales of the CDSEF-SF for intervention and comparison groups at Time 1 and Time 4 257
8.4.1.4 Results for repeated measures ANOVA for CDMSE over time for the intervention group only 260
8.4.1.5 Results for repeated measures ANOVA for the four subscales of the CDSES-SF over time for the intervention group only 261
8.4.2 Impact of intervention on career indecision
8.4.2.1 Testing of assumptions for mixed ANOVA 265
8.4.2.2 Results for mixed ANOVA for interaction effects between group and time on career indecision for intervention and comparison groups for Time 1 and Time 4 266
8.4.2.3 Results for repeated measures ANOVA for career indecision over time for the intervention group only 267
8.4.3 Impact of intervention on career decision-making difficulties
8.4.3.1 Testing of assumptions for mixed ANOVA 268
8.4.3.2 Results for mixed ANOVA for interaction effect between group and time on decision-making difficulties for intervention and comparison

groups for Time 1 and Time 4 269

8.4.3.3 Results for mixed ANOVA for interaction effect between group and time on main categories of decision-making difficulties for intervention and comparison groups for Time 1 and Time 4 270

8.4.3.4 Results for mixed ANOVA for interaction effect between group and time on subcategories of decision-making difficulties for intervention and comparison groups for Time 1 and Time 4 272

8.4.3.5 Results for repeated measures ANOVA for decision-making difficulties for the intervention group only over four time points 281

8.4.3.6 Results for repeated measures ANOVA for main and subcategories of decision-making difficulties for the intervention group only over four time points 283

8.5 Discussion of findings 295

8.6 Feedback form 302

8.7 Email interviews 303

8.8 Chapter summary and conclusions 306

CHAPTER 9 – RELATIONSHIP BETWEEN CDMSE AND CAREER INDECISION, AND BETWEEN CDMSE AND DECISION-MAKING DIFFICULTIES

9.1 Chapter overview 308

9.2 The present investigation 308

9.3 Statistical methods used to explore relationships between variables 310

9.4 Research question three – What is the relationship between CDMSE and career indecision? 311

9.4.1 Results from correlational analyses 311

9.4.2 Results from regression analyses 313

9.5 Research question four - What is the relationship between CDMSE and career decision-making difficulties? 314

9.5.1 Results from correlational analyses 314

9.5.2 Results from regression analyses 317

9.6 Structural model of the relationship among three constructs 319

9.6.1 Overview and hypothesis 319

9.6.2 Method

9.6.2.1 Participants 321

9.6.2.2 Instruments 321

9.6.2.3 Statistical analyses 322

9.6.3 Results for CFA 322

9.6.4 Results for the measurement model 325

9.6.5 Results for the structural model 326

9.6.6 Discussion of findings for the structural model 329

9.7 Discussion of overall findings 331

9.8 Chapter summary and conclusions 334

CHAPTER 10 – GENDER AND CAREER DECISION-MAKING

10.1 Chapter overview 335

10.2 Gender and career decision-making 335

10.3 Statistical methods used to analyse data 337

10.4 Results

10.4.1 CDMSE and gender 338

10.4.1.1 Results from comparing intervention and comparison groups 338

10.4.1.2 Results from intervention group only 342

10.4.2 Career indecision and gender 345

10.4.2.1 Results from comparing intervention and comparison groups 346

10.4.2.2 Results from intervention group only 347

10.4.3 Career decision-making difficulties and gender

10.4.3.1 Results from comparing intervention and comparison groups 348

10.4.3.2 Results from intervention group only 354

10.5 Discussion of findings 358

10.6 Chapter summary and conclusions 361

CHAPTER 11 – GENERAL DISCUSSION, IMPLICATIONS AND FUTURE RESEARCH

11.1 Chapter overview 363

11.2 Summary of research findings 363

11.3 Theoretical and practical implications

11.3.1 Instruments to measure CDMSE, career indecision and decision-making difficulties 369

11.3.2 Effectiveness of the intervention 372

11.3.3 Relationships among constructs 376

11.3.4 Gender and career decision-making 377

11.3.5 Future research work 379

11.4 Methodological implications 379

11.5 Limitations of study 381

11.6 Suggestions for future research 382

11.7 Recommendations for the implementation of career interventions in Malaysia 385

11.7 Conclusions 387

REFERENCES 392

APPENDICES 420

Appendix A: *Making Career Decision (MCD) questionnaire booklet* 421

Appendix B: *Permission to use the CDSES-SF and CDDQr* 434

Appendix C: *Approval letter from Research Ethics Committee* 435

Appendix D: *Student Consent Form* 436

Appendix E: *A. Student Course Book – sample pages* 437

B. Personal value cards – some samples 447

C. Handout on role models – an excerpt 448

Appendix F: *Manual for Instructors – sample pages* 449

Appendix G: *Sample responses from students in the feedback forms and email interviews* 457

PREFACE

This thesis describes the research work that involved the design and development of a theoretically-based intervention to help college students make career decisions. Specifically, the career intervention aims to increase career decision-making self-efficacy, and reduce career indecision, and career decision-making difficulties. The intervention is based on Crites' (1978) Career Maturity Theory, draws on Bandura's (1977, 1986) self-efficacy theory, and incorporates Brown and Ryan Krane's (2000) critical components of career interventions. The effects of this intervention are evaluated and the findings are described with reference to existing research literature.

This thesis is organised into 11 chapters. Chapter 1 [*Introduction*] gives a broad overview of the research project reported in this thesis. It describes the background to the problem, and explains the motivation for pursuing this line of research. It also details the significance of the research and its potential contributions in the area of career interventions research.

Chapters 2 and 3 serve to establish the theoretical framework for the research project; define key terminology and identify gaps in knowledge that this research project aims to fill. Chapter 2 [*Career Decision-Making: A Review of Literature*] discusses career decision-making research and focuses on three constructs that are of central importance to the present study, namely career indecision, career decision-making difficulties, and career decision-making

self-efficacy. Chapter 3 [*Career Interventions: A Review of Literature*] discusses career interventions that have been developed to modify career decision-making self-efficacy; critical components in career interventions; types of interventions including career courses; and gender. This is then followed by the research aims, research questions and hypotheses of the present study.

Chapter 4 [*Research Design and Methodology*] details the rationale for the research design and methodology chosen for this investigation, followed by the sampling strategy adopted, sample size requirements and a description of the participants. The chapter also includes a detailed description of the instruments used, the procedure adopted, and how ethical issues were addressed.

Chapter 5 [*Career course as Intervention*] describes the career course that was designed and developed as an intervention for Malaysian college students who are undecided about a course to pursue at university or a career. This chapter details its theoretical foundations; critical intervention components; objectives; length; and techniques, activities and materials used; and explains the rationale behind its development.

The main instruments for data collection in the present study are the Career Decision Self-Efficacy Scale – Short Form (CDSES-SF), the Career Decision Scale (CDS), and the revised version of the Career Decision Difficulties Questionnaire (CDDQr). Although these instruments have been validated by numerous studies, the factor structure of these instruments have not been

explored using a Malaysian sample. Chapter 6 [*Investigation into the Factor Structure of Main Instruments*] details the investigation into the factor structure of these instruments with a Malaysian sample.

Chapter 7 [*Pilot Study*] presents a detailed description of the pilot study that was carried out prior to the main study and its contribution to the main study.

Chapter 8 [*Impact of Intervention on CDMSE, Career Indecision and Decision-Making Difficulties*] details the statistical and descriptive analyses of data collected for the main study, and addresses the second research question regarding the impact of the intervention on CDMSE, career indecision and career decision-making difficulties.

Continuing on from Chapter 8, Chapter 9 [*Relationship between CDMSE and Career Indecision, and between CDMSE and Decision-Making Difficulties*] addresses the third and fourth research questions regarding the relationship between CDMSE and career indecision, and between CDMSE and career decision-making difficulties.

Chapter 10 [*Gender and Career Decision-Making*] details the statistical analyses of data in order to address research question five concerning gender and career decision-making.

Chapter 11 [*General Discussion, Implications and Future Research*] summarises the research findings of the present investigation. Next, theoretical,

practical and methodological implications of these findings are discussed. It then proceeds with a discussion of the limitations of the study and suggestions for future research. A set of recommendations for implementing career interventions in schools and colleges is included. The chapter then concludes with a summary of the overall contribution of the present study to intervention research.

LIST OF TABLES

		Page
Table 1.1	Pre-university courses in Malaysia	36
Table 3.1	Summary of intervention studies reviewed in section 3.2	100
Table 4.1	Measurement points for the intervention group	125
Table 4.2	Students who completed the MCD at various time points	134
Table 4.3	Demographic characteristics of participants	135
Table 4.4	Revision to items on the CDS and CDSES-SF	146
Table 4.5	Attrition rate of students over the duration of the course	151
Table 4.6	Counterbalancing of instruments	154
Table 5.1	Contents of the course and the sessions and activities that integrate Crites' (1978) Career Maturity Theory, Bandura's (1986) four sources of information, and Brown and Ryan Krane's (2000) five critical components	179
Table 6.1	CFA Goodness-of-Fit Statistics for three Models of the Career Decision Self-Efficacy Scale-Short Form (CDSE-SF) (N = 692)	195
Table 6.2	CFA Goodness-of-Fit Statistics for two Models of the Career Decision Scale (CDS) (N = 692)	203
Table 6.3	CFA Goodness-of-Fit Statistics for two Models of the Career Decision-Making Difficulties Questionnaire (CDDQr) (N = 692)	212
Table 7.1	Demographic characteristics of students	223
Table 8.1.	Cronbach's alpha for CDS, CDSES-SF and CDDQr and their subscales at four time points	253

Table 8.2	Pre-test and Post-test Scores for the Intervention and Comparison Groups on the CDSES-SF and four subscales	260
Table 8.3	Pre- and post-test scores for the CDDQr total, main and subcategories for the intervention and comparison groups, and interaction effects	280
Table 8.4	Differences in mean scores between Time 1 and Time 4 for the intervention and comparison groups, *F*-test results, significance and effect sizes	281
Table 8.5	Summary of results for CDMSE, career indecision and decision-making difficulties from mixed ANOVA for intervention and comparison groups, and from repeated measures for the intervention group only	294
Table 9.1	Pre-test and Post-test Bivariate Intercorrelations between CDS and CDSES-SF Total and Subscales Scores (pre-test n = 244; post-test n = 222)	312
Table 9.2	Regression analyses for CDMSE on Career Indecision	313
Table 9.3	Pre-test and Post-test Bivariate Intercorrelations between CDSES-SF Total and subscales, and CDDQr and main category scores (pre-test n = 244; post-test n = 222)	315
Table 9.4	Regression analyses for CDMSE on Career Decision-Making Difficulties	318
Table 9.5	Regression path coefficients and their significance	328
Table 9.6	Standardised regression weights	329
Table 10.1	Mean scores for male and female students for intervention and comparison groups, and *F*-test of significance at Time 1 and Time 4	346

Table 10.2 Mean scores for male and female students for intervention and comparison groups, and *F*-test of significance at Time 1 and Time 4 352

LIST OF FIGURES

		Page
Figure 2.1	Literature map of outline of review	46
Figure 4.1	Experimental research design	122
Figure 4.2	Quasi-experimental non-equivalent comparison group research design	124
Figure 6.1	CFA Model of Career Decision Self-Efficacy Scale – Short Form - Original Model	189
Figure 6.2	CFA Model of Career Decision Self-Efficacy Scale – Short Form - Re-estimated Model (Model 2)	193
Figure 6.3	CFA Model of Career Decision Self-Efficacy Scale – Short Form - Model 3 (with four factors)	194
Figure 6.4	CFA Model of Career Decision Scale – Original Model as per Shimizu et al. (1988)	202
Figure 6.5	CFA Model of Career Decision Scale – Model 2 (with one item removed)	204
Figure 6.6	CFA Model of Career Decision-Making Difficulties – Original Model	211
Figure 7.1	Mean scores for Career Decision-Making Self-Efficacy at the three time points	229
Figure 7.2	Mean scores for Career Indecision at the three time points	231
Figure 7.3	Mean scores for Career Decision-Making Difficulties at the three time points	232

Figure 7.4 Significant interaction effects of time and gender on career indecision 236
Figure 7.5 Significant interaction effects of time and gender on career decision-making difficulties 237
Figure 8.1 Significant interaction effect of group and time on Career Decision-Making Self-Efficacy 257
Figure 8.2 Significant interaction effect of group and time on the four subscales of the CDSES-SF 259
Figure 8.3 Mean scores for Career Decision-Making Self-Efficacy at the four time points 261
Figure 8.4 Mean scores for the four subscales of the CDSES-SF at the four time points 264
Figure 8.5 Significant interaction effect of group and time on Career Indecision 267
Figure 8.6 Mean scores for Career Indecision at different time points 268
Figure 8.7 Significant interaction effect of group and time on Career Decision-Making Difficulties 270
Figure 8.8 Significant interaction effect of group and time on the three main categories of difficulties 272
Figure 8.9 Significant interaction effects of group and time on the 10 subcategories of difficulties 278
Figure 8.10 Mean scores for Career Decision-Making Difficulties at four time points 282

Figure 8.11 Mean scores for the main category Readiness and its three subcategories at four time points 286
Figure 8.12 Mean scores for the main category Lack of information and its four subcategories at four time points 290
Figure 8.13 Mean scores for the main category Inconsistent information and its four subcategories at four time points 293
Figure 9.1 Measurement model of CDMSE, career indecision and decision-making difficulties 326
Figure 9.2 Standardised structural model of CDMSE, career indecision and decision-making difficulties 327
Figure 9.3 Unstandardised structural model of CDMSE, career indecision and decision-making difficulties 328
Figure 11.1 Simplified structural model of the relationship among CDMSE, career indecision and decision-making difficulties 376

LIST OF ABBREVIATIONS AND ACRONYMS

A Level	Advanced Level of the British General Certificate of Education
AMOS	Analysis of Moment Structures
ANOVA	Analysis of Variance
CDDQ	Career Decision Difficulties Questionnaire
CDDQr	Revised Career Decision Difficulties Questionnaire
CDM	Career Decision Making
CDMSE	Career Decision-Making Self-Efficacy
CDS	Career Decision Scale
CDSES	Career Decision Self-Efficacy Scale
CDSES-SF	Career Decision Self-Efficacy Scale – Short Form
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CI	Confidence Interval of the mean
CS	Certainty Scale
DV	Dependent Variable
EFA	Exploratory Factor Analysis
GFI	Goodness of Fit
IS	Indecision Scale
IV	Independent Variable
KMO	Kaiser-Meyer-Olkin
LGM	Latent Growth Curve Model
M	Mean

MCD	Making Career Decisions Questionnaire Booklet
MVS	My Vocation Situation
N	Number of cases
PAF	Principal Axis Factoring
RMSEA	Root Mean Square Error of Approximation
SCCT	Social Cognitive Career Theory
SD	Standard Deviation
SDS	Self-Directed Search
STPM	*Sijil Tinggi Pendidikan Malaysia* (High School Certificate of Education)
SII	Strong Interest Inventory
SEM	Structural Equation Modelling
USA	United States of America

CHAPTER 1 – INTRODUCTION

1.1 Chapter overview

This chapter presents a broad overview of the research project reported in this thesis. It provides the background to the problem and context for the thesis; and explains the motivation for pursuing this line of research. It also details the significance of the research and its potential contributions in the area of career interventions research. It then concludes with a summary of the main contributions of this research.

1.2 General statement of problem area

The ability to make good career decisions has become increasingly important because of changing work practices worldwide as a result of rapid globalisation and technological advances. With increased choice of courses at university, and more opportunities and options to pursue tertiary education, in addition to expanding work opportunities globally, the career decision-making process has become more complex, and as such, more challenging for students. Besides, career expectations have changed over the years. In addition to financial security, people want careers that are meaningful and satisfying on a deeper level.

In the United States of America (USA), where most studies on career decision-making have been conducted, students attend technical or vocational institutes,

two-year community colleges or four-year colleges or universities after completing high school or Grade 12. Students also have the option of attending a community college before applying to four-year colleges or universities. Students in community colleges, colleges or universities, studying undergraduate courses are generally referred to as 'college students'. Most colleges and universities offer a liberal education to undergraduate students which means that students are required to take courses across several disciplines before they specialise in a specific field or major[1].

Many college students lack the knowledge and experience required to make an informed decision about majors to choose and career path to take (Kelly & White, 1993, cited in Orndorff & Herr, 1996). Hartman, Fuqua and Hartman (1983) reported that if undecided students did not receive help, they were more likely to drop out of school and were unhappy with their eventual choice of a career. Plaud, Baker and Groccia (1990) found that students are more likely to get lower grades and experience more difficulty with adjusting to college if they remain undecided about a major or career. Furthermore, if decision-making difficulties are not addressed, students may make less than optimal career and academic choices which in turn will significantly impact their future (Fouad, Cotter & Kantamneni, 2009). In addition, Herr (1989) found that in the USA, high levels of career uncertainty and occupational dissatisfaction are positively correlated with high levels of psychological and physical distress. Mortimer, Zimmer-Gembeck, Holmes and Shanahan (2002) proposed that one of the reasons for this problem of making career decisions is because

[1] US Department of Education. http://www2.ed.gov/about/offices/list/ous/international/usnei/us/edlite-structure-us.html (Accessed 1 August 2012)

adolescents do not receive the assistance in acquiring the necessary skills for managing their career development effectively.

As a result of these research findings, schools and colleges try to help students by carrying out interventions to increase students' ability to make career decisions. However, many of these interventions are not based on the latest research and career theory (Reese & Miller, 2006). In the USA, Halasz and Kempton (2000) found that the majority of the 40 universities they surveyed did not use a theory or were not able to identify which theory was included in their career course curriculum. This means that the content of these courses is based on 'common-sense rather than well-reasoned, consensually produced, empirically tested methods' (Reese & Miller, 2006, p. 263).

Theoretically-based interventions that receive empirical support have great utility for career development professionals such as vocational psychologists and career counsellors who are often presented with undecided students needing help, and are hard-pressed for time. Therefore, instead of spending additional time and resources to develop new interventions to help their students, Gainor (2005) suggests that career development professionals adapt these theoretically-driven interventions for their own use by making minor modifications to suit their populations. By doing this, valuable time and resources can be better spent helping students make good career decisions.

Career decision-making is of particular relevance to my study because this appears to be a problem faced by many students entering post-secondary

education in Malaysia. When I worked as an education and graduate careers publisher, I had the opportunity to work closely with students, and career counsellors and advisers in secondary schools and colleges. Many students are undecided about a course to pursue at university and/or a career to undertake upon graduation when they enter post-secondary education (Lam, 2008). Furthermore, they are anxious about their future and they want help. In a study among university students in Malaysia, Mansor and Tan (2009) found that students with high academic achievement have high career indecision scores indicating that they are undecided, anxious about making career decisions and have a greater need for careers information and self-knowledge. To my knowledge, schools and colleges or universities in Malaysia do not carry out formal career interventions to help students in the area of making career decisions. Even if they do carry out career-related activities, these are short, ad-hoc activities that are neither systematically planned nor theoretically-based. Therefore, interventions specifically developed to help students make career decisions are very much needed in Malaysia. Malaysia has been chosen as the research location as I am most concerned about the situation here, having lived and worked most of my life in this country. To gain a better understanding of the situation in Malaysia, a brief history of the country, its demographics, economic activities, and education system are described below.

1.3 Malaysia: a brief history, demographics, economic activities and education system

Malaysia achieved its independence from colonial British rule in 1957 and is

part of the Association of South East Asian Nations (ASEAN). Traditionally an agricultural economy, the country's main economic activities today are services and manufacturing[2]. In 2010, Malaysia was the world's 23rd largest exporter and 25th largest importer of merchandise trade[3]. In terms of world trade in commercial services, Malaysia was ranked 29th and 30th for exporter and importer respectively[4]. Malaysia has a goal of achieving developed nation status in 2020, and is thus changing rapidly (Lim, 2001).

Malaysia has a population of 28.34 million people and is made up of three main ethnic groups: Bumiputera (Malay and other bumiputera) 65.1%, Chinese 26% and Indian 7.7%[5]. The Malays were historically farmers and fishermen while the immigrant Chinese and Indians were involved in tin mines and rubber plantations. Since the implementation of the New Economic Policy in 1970, the ethnic composition of the Malaysian workforce has changed. In 1970, Bumiputeras made up 30% and 37% of employment in the secondary (e.g., mining, manufacturing, construction, utilities and transport) and tertiary (wholesale and retail trade, finance, government and other services) sectors respectively. In 1990, their employment share increased substantially to 51% and 48% respectively (Lim, 2001).

[2] Statistics Handbook of Malaysia, 2011, Department of Statistics, Malaysia
[3] Leading exporters and importers of world merchandise trade, 2010, World Trade Organisation http://www.wto.org/english/res_e/statis_e/its2011_e/its11_world_trade_dev_e.htm (Accessed 6 August 2012)
[4] Leading exporters and importers of world trade in commercial services, 2010, World Trade Organisation, http://www.wto.org/english/res_e/statis_e/its2011_e/its11_world_trade_dev_e.htm (Accessed 6 August 2012)
[5] Statistics Handbook of Malaysia, 2011, Department of Statistics, Malaysia

The Malaysian education system is different from the education system in the USA. Students generally begin formal primary education at age seven for six years, and secondary education at age 13 for five years in government-funded schools. There are three types of government-funded secondary schools: academic, technical and vocational. Post-secondary education is carried out in government colleges or polytechnics, institutes of teacher education, and universities; and in private institutions.[6] There are also privately run Chinese independent high schools and international schools in Malaysia offering different curricula and medium of instruction. These schools have different entry requirements and children usually begin school a year or two earlier depending on the school and curriculum.

There are various types of programmes designed to prepare students for university when they finish secondary school at age 17. Students normally choose to study in public schools and colleges if they desire to study at public universities. Public universities accept only the *Sijil Tinggi Pelajaran Malaysia* (or *High School Education Certificate*, commonly known as STPM), the local matriculation diploma conducted at government matriculation colleges, and selected diplomas from government colleges as entry qualifications. The STPM, the examination that students sit for at the end of their Form Six studies, is the equivalent of the British General Certificate of Education – Advanced Level (A Level) and is recognised internationally for entrance into universities in the United Kingdom and most universities worldwide.

[6] Statistics Handbook of Malaysia 2011, Department of Statistics, Malaysia

Students from Chinese independent high schools may choose to sit for the Unified Examination Certificate Senior Middle Three level (UEC) after completing high school. This certificate is accepted for admission to most universities overseas, and local private colleges or universities, and is conducted in Mandarin.

Students normally study in private colleges if they plan to continue their education in private institutions locally or at universities abroad. Various pre-university courses are offered, the most popular being the A Level because of its worldwide recognition and acceptance as an entry qualification for universities. Students usually study the A Level if they plan to study in British universities; the Canadian matriculation and American degree programme (also known as American transfer or American university programme) for Canadian or American universities; the Australian matriculation programme for Australian universities; and the International Baccalaureate diploma for countries that accept this qualification. These pre-university qualifications are generally accepted by most universities abroad as well as by private institutions locally for entry into undergraduate programmes, provided they meet the requirements. Students also study on various foundation programmes if they plan to continue their studies in the same private institution or transfer to a university abroad which has arrangements with the local institution.

See Table 1.1 for a summary of the pre-university courses available in Malaysia.

Table 1.1

Pre-university courses in Malaysia

Course / Qualification	**Offered by type of institution**
Form Six / STPM	Government
Local Matriculation	Government
Diploma Programme	Government
A Level	Private
Australian Matriculation / South Australian Matriculation	Private
Canadian Matriculation / Canadian International Matriculation Programme	Private
American degree programme / American Transfer Programme / American University Programme	Private
International Baccalaureate (IB)	Private
Unified Examination Certificate Senior Middle Three level (UEC)	Private

Students from these pre-university courses and specifically students on the A Level course have been chosen as the target population for this study because they need to make important course and/or career decisions at this stage of their lives. While students may ponder over course or career-related decisions at other stages of their education, students need to make university applications where they need to specify the course they wish to pursue at university during their pre-university course. In a study by Kleiman et al. (2004), it was found that sophomores at an American university had higher levels of decision-making difficulties compared to seniors because a major was expected to be chosen by then. Similarly, it was expected that Malaysian students at this stage

of their career development would experience the most difficulties in making career decisions.

For the purposes of the present study, students entering post-secondary education in Malaysia will be called 'college students'.

1.4 Significance of the study

The number of students entering post-secondary education in Malaysia has increased tremendously in the last decade in line with the government's efforts to increase the number of graduates in the country. According to the Ministry of Higher Education, the number of Malaysian students enrolled in undergraduate degree programmes at government and private institutions of higher learning in the country was 251,252 in 2002. This number increased to 388,580 within five years in 2007[7]. In 2011, the number of students enrolled in undergraduate programmes was 479,244[8]. From the period of 1982 to 2010, the number of graduates (with an undergraduate degree) entering the labour force increased from 93,800 to 1.15mil. In the same period, unemployment among graduates also rose from 2,700 persons to 33,800 persons. The unemployment rate among graduates in 2010 was 2.9 per cent. In the 1980s, unemployed male graduates were more compared to female graduates. Since 1999, there have been more unemployed female graduates compared to male graduates. In 2010,

[7] Macro Data, Ministry of Higher Education, Malaysia, http://www.mohe.gov.my/web_statistik/statistik_pdf_2008_05/data_makro_1-2.pdf (Accessed 6 August 2012)
[8] Malaysia Higher Education Statistics 2011, Ministry of Higher Education, Malaysia, First Edition 2012

the majority of unemployed graduates were from the social sciences, business and law followed by engineering, manufacturing and construction[9].

Despite greater access to higher education, students receive little help in managing their career development as evidenced by the absence of a national agenda or curriculum for careers guidance and counselling in government-funded schools. In fact, careers guidance and counselling were not even listed among the ten core services that should be provided in secondary schools in the Ministry of Education's *Handbook for the Implementation of Guidance and Counselling Services in Secondary Schools* that was published in 1984 (Sidek et al., 2005).

Sensing the growing need for careers guidance and counselling, the latest Ministry of Education's *Handbook for the Implementation of Guidance and Counselling Services in Primary and Secondary Schools* in 2010 lists 'career' as one of the eight core services that should be provided by full-time counsellors in primary and secondary schools. However, the current ratio of counsellor to student as approved by the Ministry of Education is 1:500 for primary schools and 1:350 for secondary schools (p. 5)[10], so it is not surprising that the help received is inadequate. Furthermore, all career-related activities planned are limited to only five months of the academic year (i.e., from March to July), and constitute only 10 percent of the total time spent by the counsellor, according to the annual work schedule for school counsellors (p.

[9] Statistics of Graduates in the Labour Force Malaysia 2011, Department of Statistics, Malaysia
[10] Handbook for the Implementation of Guidance and Counselling Services in Primary and Secondary Schools 2010, Ministry of Education, Malaysia

30). Clearly, careers guidance and counselling has not received the attention that it deserves.

With increased choice of courses of study at university and changing work requirements, the need for career interventions among students will only increase (Fouad et al., 2009). Research has shown that even students who have declared a major remain uncommitted to their choice and could benefit from career counselling services (Newman, Fuqua & Minger, 1990), which are a form of career intervention. Developing an intervention that is theoretically-based and culturally sensitive is therefore one of the main aims of the present study. The outcome of this study will have important implications for this target population.

This study is significant for two major reasons. First of all, Malaysia is in need of a theoretically-based career intervention to help students entering post-secondary education make career decisions. However, most empirically tested career interventions were carried out in the USA. In Gainor's (2006) review of the effectiveness of theory-based interventions in the past 25 years (1981-2005), most of the studies were conducted with American populations. In recent years, there have been studies on career interventions in Taiwan (e.g., Peng & Herr, 1999), and the Middle East (e.g., Gati, Ryzhik & Vertsberger, 2013) but none to my knowledge in Malaysia. While Malaysia is an Asian country, it has a different political and educational system, and a unique racial and cultural heritage compared to other Asian countries, like Taiwan, Korea and China which are less ethnically diverse. Therefore, there is a need for

research to determine if theory-based interventions that have been shown to have positive outcomes in other countries will have similar effects among a Malaysian population. Results from a Malaysian study will not only extend our knowledge in the area of career decision-making, but also provide valuable input to developing a comprehensive and culturally-sensitive career intervention that works for students in schools and colleges in Malaysia.

According to Hofstede and McCrae (2004, p. 63), in collectivist societies, 'people are integrated from birth onward into strong, cohesive in-groups, often extended families (with uncles, aunts and grandparents), protecting them in exchange for unquestioning loyalty.' In individualist societies, their opposite, the ties between individuals are loose. Malaysians were indexed as a collectivist society on Hofstede's country individualism index of 20 (Bochner, 1994). In Malaysia, women still shun engineering and scientific fields, and do not participate as actively as men in the economy. This is evident from academic and employment statistics of the country. For example, in the 2010-2011 academic year, there were 110,064 male students in engineering fields of study compared to only 62,219 female students. In the same period, 33,177 male students were enrolled in science, mathematics and computer courses compared to only 20,637 female students in the same courses in private institutions of higher learning[11]. In 2010, the participation rate in the labour market was 78.7 percent and 46.1 percent for men and women respectively. In the same year, 7.9 percent of women from 15 to 64 years of age were unpaid family workers; only 1.7 percent were employers and only 12.1 percent were

[11] Malaysia Higher Education Statistics 2011 (First Edition 2012), Ministry of Higher Education, Malaysia

self-employed. Within the same period and age range, only 2.6 percent of men were unpaid family workers; 5.2 percent were employers and 20.1 percent were self-employed. In 2010, there were more men than women in almost every category of industry except education, and human health and social work activities[12]. These fields are where traditional occupations for women are mostly found according to Betz and Hackett (1981). It is evident, therefore, that despite government efforts to propel the country to developed nation status by the year 2020, Malaysia remains very much an Asian country with collectivist societal norms where girls are socialised differently compared to boys and are not given similar opportunities to make career decisions. As gender will be examined in the present study, the findings of the present study will add to our knowledge and understanding of how and if gender affects the career decision-making process. This has important implications on how career interventions are carried out successfully.

Secondly, there are few studies that evaluate intervention effects in the area of career decision-making among college students. According to Reese and Miller (2006), the number of studies on college career courses designed to help students make career decisions is decreasing. Whiston and Brecheisen (2002) also noted the decrease in the number of career intervention outcome studies. From 1976 to 2003, there appears to have been an inverse trend of career course studies in relation to the popularity of these courses in the USA (Reese & Miller, 2006). They assert that as these courses are becoming more popular among students, there is a need to make sure that 'today's career theories and

[12] Key Indicator of the Labour Market Malaysia, 2001-2010, Department of Statistics, Malaysia

pedagogical methodologies in career courses are responsive to students' needs and the changing [job] demands' (p. 253). The present study will most certainly add to the literature on theoretically-based career interventions for college students.

In addition, the instruments developed to assess the constructs related to career decision-making, include the Career Decision Scale (Osipow, Carney, Winer, Yanico, & Koschier (1976) to assess career indecision; the Career Decision Self-Efficacy Scale (Taylor & Betz 1983) (this 50-item scale was subsequently revised and shortened to the Career Decision Self-Efficacy Scale – Short Form by Betz, Klein & Taylor, in 1996) to assess career decision-making self-efficacy; and the Career Decision-Making Difficulties Questionnaire (Gati, Krausz & Osipow, 1996) (this 44-item measure was eventually shortened to 34 items by Gati & Saka, 2001b) to measure difficulties associated with making career decisions. These instruments were developed more than a decade ago, and were validated by using mainly American samples of students. Therefore research is needed to ascertain if these instruments are still robust in measuring what they were developed to do so many years ago. Besides, while these instruments have been shown to be valid and reliable for many populations, they have not been used with a Malaysian population. Therefore, research using these instruments in a Malaysian context will contribute further to the validation of these instruments in this part of the world. Furthermore, most career development research tended to rely on samples that are 'restricted in cultural and geographical diversity (i.e., from Western countries), thereby limiting the generalisation of findings across cultures' (Leung, Hou, Gati & Li,

2011, p. 11). The present study on an Asian population such as Malaysia will contribute to cross-cultural career development literature generally speaking and help inform government policies and initiatives to provide adequate career services to students that will benefit students in Malaysia specifically.

1.5 Chapter summary and conclusions

This chapter has highlighted the importance and need for career interventions for college students in Malaysia, and provided justification for the research project. In summary, the main contributions of this research are as follows:

1. The development of a theoretically-based, empirically-validated and culturally-sensitive career intervention to help Malaysian college students make career decisions.
2. A deeper understanding of the relationships among career decision-making self-efficacy, career indecision and career decision-making difficulties, the three constructs being investigated in the present study.
3. The validation of three instruments that are widely used in career interventions and career intervention research with Western populations with a Malaysian population.
4. An understanding of gender and its impact on career interventions for Malaysian college students.
5. A set of recommendations for implementing career interventions in Malaysian schools and colleges.

Having presented the problem area, the purposes for investigating this research area, and the contributions of this project, the next two chapters detail a review of key research literature that formed the basis of this area of inquiry, and identify the gaps in knowledge that require further investigation.

CHAPTER 2 – CAREER DECISION-MAKING: A REVIEW OF LITERATURE

2.1 Chapter overview

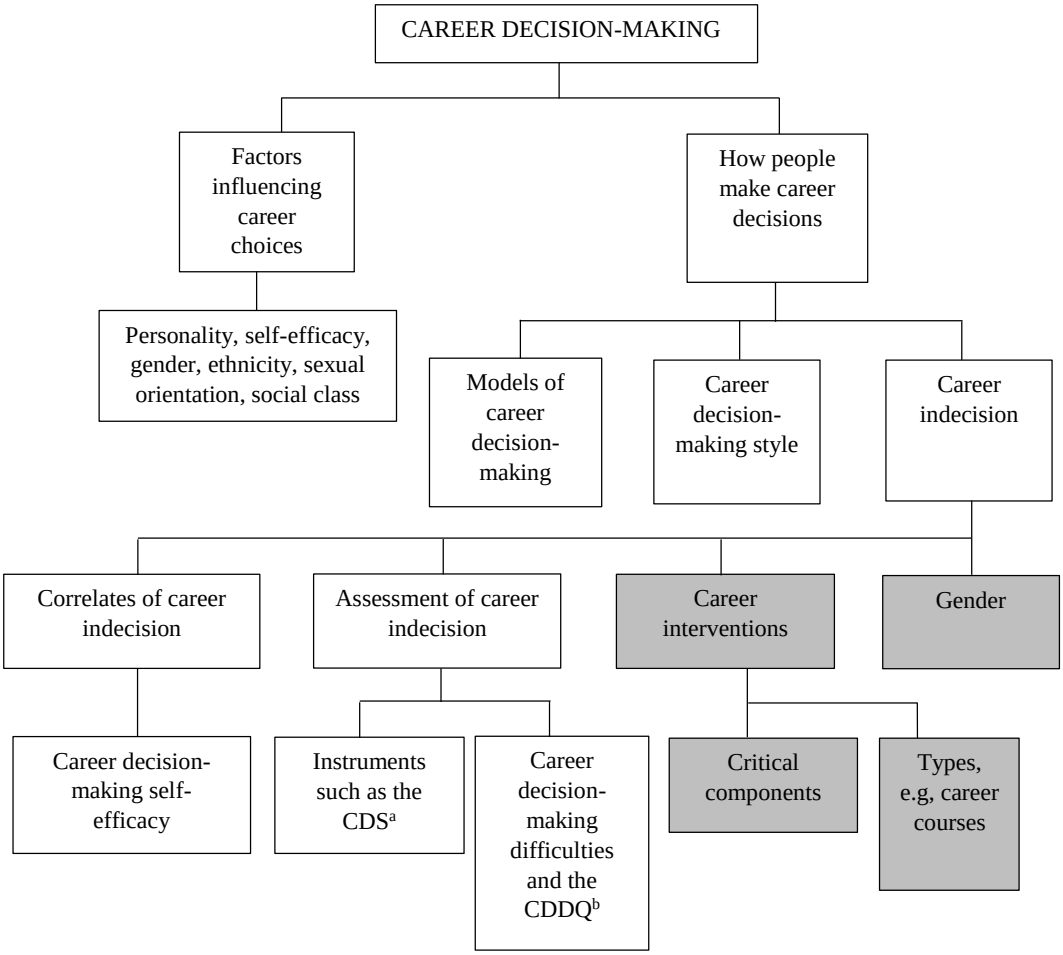
This chapter and the next one serve to establish the theoretical framework for the research project, define key terminology and identify gaps in knowledge that this research project aims to fill.

This chapter traces the beginnings of career decision-making research (Section 2.2), and discusses its development which include theories and models developed to explain how decisions are made and difficulties encountered. Particular attention is given to three constructs, namely career indecision (Section 2.3), career decision-making difficulties (Section 2.4), and career decision-making self-efficacy (Section 2.5).

The next chapter details the discussion of career interventions that have been developed to modify career decision-making self-efficacy; critical components in career interventions; types of interventions including career courses; and gender.

An outline of the review of literature for this chapter as well as the next one is presented in the form of a literature map[13] in Figure 2.1.

[13] As suggested by Creswell (2003).



[a] Career Decision Scale by Osipow et al. (1976)

[b] Career Decision Difficulties Questionnaire by Gati et al. (1996)

Will be discussed in Chapter three

Figure 2.1. Literature map of outline of review

Studies on career decision-making involving career indecision, career decision-making difficulties, career decision-making self-efficacy, and career interventions, constitute the major underpinnings of the present study. The studies for review were chosen on the basis of their relevance to this study in terms of constructs investigated, the effects of interventions and sample population.

2.2 Career decision-making

With changing work environments and expectations as a result of emerging technologies, increasing diversity of workers and a global economy, people seldom remain in one career or company for the entire duration of their work life. Instead, a career is now viewed as a series of choices or 'forced transitions' that individuals make over a life span (Fouad, 2007). Research in career decision-making can be divided into two major areas: factors influencing career choices and how people make career decisions (Fouad, 2007).

Research on factors influencing career choices focuses on the role of work personality (e.g., Parsons, 1909, and Holland's theory), development over the lifespan (e.g., Super's theory, 1957), self-efficacy (Betz & Hackett 1981), and other contextual influences such as gender, ethnicity, sexual orientation and social class. Research in this area seeks to explain why people make certain career choices, or why people gravitate towards certain careers.

Another major area of research within career decision-making has to do with how people make career decisions and what happens when people are unable to make career decisions. Career decision-making is a complex process and various models have been developed to explain or describe this process. Along with models of the career decision-making process, career decision-making style is also an area that is investigated. In addition, much research within career decision-making focuses on investigating career indecision, its

correlates and assessing career indecision, with the aim of informing practice, especially in the area of developing career interventions to help students make career decisions.

For the purposes of the present study, only publications focusing on how people make career decisions and what happens when people are unable to make career decisions are included for review. This is because articles in this area have the most relevance to the aims of my research.

2.2.1. Models of career decision-making

Three types of models that have been developed for understanding how decision-makers process information and arrive at a decision. Normative models of decision-making drew heavily from 'subjective expected utility' (SEU) theory in that they assume that individuals should choose rationally based on maximum returns (Gati & Tal, 2008). These models presume that all decision-makers are able to identify payoffs for every alternative, and are able to process a lot of information before arriving at a decision.

Descriptive models sought to describe how people make decisions. Simon (1955) proposes that people adopt 'satisficing' strategies when making decisions, in that they consider alternatives one at a time and choose the alternative that appears 'good enough' rather than the best one. Tversky's (1972) 'elimination by aspects' model proposed that the decision-maker systematically works through a hierarchy of criterion from most important to

least important before arriving at a decision. Drawing on Tversky's model, Gati (1986) developed the 'sequential elimination model' that proposes that decisions are made through sequential elimination in that each alternative is systematically eliminated if it does not meet a certain criteria. Research into descriptive models show that people do not employ purely rational strategies for making decisions. In fact, they are subject to considerable cognitive biases leading to less than optimal decisions (Gati & Tal, 2008).

Both of these models have been criticised because they require the individual to have full knowledge about himself or herself, and that he or she has the ability to accurately process information about alternatives, consequences, as well as a hierarchy of criterion, in order to arrive at a decision (Krieshok, 1998). However, as information processors, individuals are prone to errors. Bodden (1970) asserts that decision makers may distort information in order to achieve cognitive simplicity, a state in which a decision could more likely be made. Krieshok (1998) even argued from an anti-introspectionist's perspective, proposing that most decisions are made outside conscious processing. However, for the purposes of the present study, self-report is considered a valid means of data collection because currently most career counsellors work with students on a conscious level (Krieshok, 1998) and most research on career decision-making uses self-report measures.

Prescriptive models (e.g., Gelatt, 1962; Janis & Mann, 1977) aim to provide a framework for a systematic process for making better decisions while acknowledging the limitations of human rationality (Gati & Tal, 2008). Gati

and Tal (2008) argue that prescriptive models incorporate the advantages of the normative and descriptive models, while minimising their disadvantages, and are evaluated based on their pragmatic value of facilitating individuals' decision-making. Gati and Tal (2008) proposed a prescriptive model called the Prescreening, In-depth Exploration and Choice or PIC Model (Gati & Asher, 2001) to demonstrate the potential usefulness of prescriptive models for facilitating career decision making for deliberating individuals.

In view that the terms of work have changed to include multiple career transitions in the lifetime, Krieshok, Black and McKay (2009) proposed a trilateral model of career decision-making that includes rational and intuitive mechanisms, both of which are kept in check by occupational engagement. Their prescriptive model of adaptive career decision making represents a conceptual shift from 'matching people to jobs' to 'adapting to change', and addresses concerns arisen from other rational prescriptive models. Krieshok et al. (2009) posit that occupational engagement includes both exploration and enrichment behaviours, and adaptive individuals behave in ways that optimise their adaptation to unexpected transitions. Although the idea of adaptive career decision-making may have implications for career interventions, this idea was not explored further as it is beyond the scope of the present study, but was included in the suggestions for future research in section 11.6.

Other authors such as Harren (1979) argue that the decision-making process is very complex and it may be unrealistic to develop a comprehensive theory that covers the entire life span. He proposed that a more manageable approach

would be to focus on a given life stage or period of development where decision making is involved. He developed a model of career decision making for college students drawing from Tiedeman and others (cited by Harren, 1979). The model specifies how the decision-making process varies according to the 'characteristics of the decision maker, the decision-making context, and the type of decision involved' (Harren, 1979, p. 120). The four interrelated parameters are process, characteristics, tasks and conditions. An individual progresses through a four-stage, sequential decision-making process in making and carrying out decisions. Decision-maker characteristics refer to the stable personality traits which determine the individual's perception of tasks and conditions, and influence his or her progress in the process of career decision-making. Tasks refer to career-relevant developmental tasks and decision-making tasks of college students. Conditions refer to situational factors influencing the individual, and to his or her present psychological state (Harren, 1979).

In summary, research on career decision-making models shows that the decision-making process is complex and that the models developed to date are unable to explain or describe this process adequately. Therefore, for the purposes of the present study, a specific period of development where decisions needed to be made has been delineated, i.e., students entering post-secondary education in Malaysia. At this life stage, students need to commit to a course of study or at least choose a specific direction, e.g, business or biomedical science. By focusing the study on this period only, it is hoped that

further insights can be gained into the process of decision-making of college students.

2.2.2. Career decision-making styles

There is also a body of research on decision-making styles within research on career decision-making. Decision-making style refers to 'a habit-based propensity to react in a certain way in a specific decision context' (Scott & Bruce, 1995, p. 820). Unlike personality traits that are consistent across different situations, there is evidence to suggest that individuals employ different styles depending on the decision-making tasks (Harren, 1979; Driver, Brousseau & Hunsaker, 1990; Scott & Bruce, 1995).

Harren (1979) identified three decision-making styles: dependent, rational and intuitive. Rational decision-makers, as the term suggests, make decisions based on a logical and systematic approach. Conversely, intuitive decision-makers, decide base on feelings and emotions. Dependent decision-makers make decisions based on the expectations and opinions of others. Scott and Bruce (1995) proposed two more styles: avoidant and spontaneous, in addition to the three by Harren (1979). 'Avoidant' decision-makers tend to avoid making decisions, and 'spontaneous' decision-makers have a sense of urgency and want to quickly make a decision.

Johnson (1978) proposed another model of decision-making types to describe and understand college student decision-making. His model consists of a 2 x 2

typology that includes two dimensions: spontaneous vs systematic and internal vs external. The spontaneous vs systematic dimension assesses how information is gathered and processed, while the internal vs external dimension describes the privacy with which people process information during decision-making. Spontaneous individuals make decisions quickly while systematic individuals consider all information carefully before making a decision. Internal individuals process information privately while external individuals verbalise their thoughts during the decision-making process.

Scott and Bruce (1995) reported that decision-making styles are not mutually exclusive and that individuals make use of different styles depending on the task and situation. This is consistent with Driver et al.'s (1990) proposition that individuals have a primary and secondary style when it comes to making decisions. While Harren (1979) suggests that the rational decision-making style is ideal and most effective, studies have been shown that the rational style is not necessarily indicative of progress in decision-making tasks (Chartrand, Rose, Elliott, Marmarosh, Caldwell, 1993; Mau, 1995). Instead, Mau (1995) proposes that the effectiveness of the rational style may be dependent on situational and cultural factors.

Cross-cultural studies on decision-making styles show that there are cultural differences among students from Western and Asian countries. For example, Mau (2000) reported that the decision-making styles of Taiwanese students differ from those of American students. Taiwanese students are more likely to adopt the dependent style of decision-making compared to American students.

Mau (2000) reasons that the 'culture of Taiwanese students emphasises social conformity and collective decisions' therefore they tend to make decisions that 'conformed to familial and societal expectations' (p. 374).

In more recent studies, researchers such as Gati, Landman, Davidovitch, Asulin-Peretz, and Gadassi (2010), and Gati, Gadassi and Mashiah-Cohen (2012) proposed that 'career decision-making profiles' rather than 'career decision-making styles' more accurately describe the way individuals approach the career decision-making process. This alternative approach offers a multidimensional profile characterisation of individuals' career decision-making processes based on 11 dimensions. As individuals differ in their approach to career decision-making, a better understanding of their decision-making profile (which includes both personality and situational influences on their decision-making behaviour) is able to facilitate more effective career counselling (Gati et al., 2010).

Although career decision-making styles and profiles will not be investigated in the present study, research on career decision-making styles has several implications for the present study. Cross cultural studies show that there are cultural differences in students' approach to the career decision-making process, and interventions developed to help individuals make career decisions should therefore take these differences into consideration. Secondly, career decision-making style is significantly related to career indecision in that a non-rational style is inversely related to progress in carrying out career-related tasks (Osipow & Reed, 1985) and career decision-making self-efficacy (Mau, 2000),

both of which are of central importance to this study. These two constructs will be discussed in detail later in this chapter.

The next section discusses research literature that is focused on answering questions on what happens when people are unable to make career decisions and the factors that are related to helping them make those decisions. One major body of research can be found in the area of career indecision.

2.3. Career indecision

Career indecision is the focus of much research within the career decision-making literature as this appears to be a concern for vocational psychologists and career counsellors who are tasked with helping college students make career decisions. It is estimated that 22-50 per cent of college and university students in the USA are undecided about a future course or career (Gordon, 1981). Research also shows that students who are undecided about a career or course of study are not a homogenous group (Gordon, 1982; Holland & Holland, 1977).

How career indecision is defined has important implications for interpreting the results of research on career indecision. For example, Hartman et al. (1983) examined the reliability and generalisability of the construct of career indecision and reported that as career indecision becomes more severe, the construct becomes more unstable. Their findings indicate that career indecision is a complex construct and that clear definitions are necessary. However,

research on career indecision shows that there are many definitions of career indecision but there is no single widely accepted one. This has impeded career decision-making research and practice somewhat (Lucas & Epperson, 1990; Hall, 1992).

Leong and Chervinko (1996, p. 316) define career indecision as 'an inability to make a decision about the vocation one wishes to pursue' while Osipow (1999) defines it as an individual's inability to make career decisions. Career indecision has also been used to refer to 'the problems individuals may have in making their career decision' (Gati et al., 1996, p. 510). These definitions of career indecision appear to be confined to making career decisions only. According to Sepich (1987), career indecision is a 'multidimensional state which includes, but is not limited to, being unsure of a college major or future career' (p. 8). He proposes that career indecision comprises subgroups of individuals who may have problems with other types of decisions (therefore multidimensional instead of unidimensional) in addition to problems with making course or career decisions. This definition appears to be wider and not limited to making a course or career decision only.

Some researchers believe that it is necessary to make a distinction between career indecision and general indecisiveness. While indecision is a developmental phase which individuals go through in the process of making a decision, indecisiveness suggests a personal trait which may persist or manifest itself in various situations in which decisions need to be made (Leong & Chervinko, 1996; Osipow, 1999). It is also important to distinguish between

the two as this has implications for helping students. A student who is indecisive may also have other problems in addition to being unable to make course and career decisions (Tyler, 1961). On the other hand, if a student is undecided about a course or major only, the student can be helped by changing the conditions for decision-making such as providing relevant information or incentives for choosing (Crites, 1969).

In the research literature, there is some disagreement as to how career indecision should be viewed whether positively or negatively. With such an emphasis in research literature on helping students make decisions or moving students from an undecided state to being decided, one is tempted to believe that career indecision is something negative and the reverse, career decidedness, is something for which to aspire (eg., Krumboltz, 1992; Gordon, 1981).

Earlier researchers argue that career indecision is negative because high levels of career indecision are associated with high levels of anxiety (Fuqua, Seaworth & Newman, 1987). Also, Chase and Keene (1981) reported that 'late deciders' (those who were unable to commit to a major) underperformed in the Scholastic Aptitude Test (SAT) talent predictions compared to those who have committed to a major. In addition, some studies have shown that career indecision prevents students from enjoying and maximising their time in college (Fuqua et al., 1987; Bergeron & Romano, 1994; Peterson, 1993). Furthermore, students who did not receive help were more likely to drop out of

school and were unhappy with their eventual choice of a career (Hartman et al., 1983).

However, Krumboltz (1992) argues that the anxiety associated with career indecision may have originated from (1) the negative connotations of the term 'undecided' (2) the social pressure to make a decision (3) social pressure to choose more prestigious careers, and (4) the lack of help or training in decision-making skills. In addition, students who are decided may have prematurely foreclosed their options. Besides, Krumboltz (1992) argues that 'being undecided might really mean that one has adopted a profound philosophical perspective that some believe leads to health and happiness' (p. 244). In the light of this argument, career indecision could be seen as something positive rather than negative. Recent research shows that career indecision is being viewed more positively (e.g., Krieshok, 2001). With changing work practices, individuals may have to make decisions more frequently in their lives. According to Osipow (1999), career indecision is a 'state which comes and goes over time as a decision is made, is implemented, grows obsolete, and eventually leads to the need to make a new decision (producing a temporary state of indecision)' (p. 147).

For the purposes of this study, the term 'career indecision' will be used to refer to students who have not made a decision about a course or major to pursue at university. Career indecision is considered a normal developmental phase that many individuals go through as they make decisions (Osipow, 1999). This

definition was chosen because it is believed that undecided students can be helped through appropriate interventions.

In literature on career indecision, researchers have focused on two major areas: identifying correlates of career indecision and assessing or measuring it (Sepich, 1987). These would be discussed in turn in the next section.

2.3.1. Correlates of career indecision

As vocationally undecided students do not always have the same problems or characteristics, it is difficult and time-consuming to determine how best to assist the student. Therefore identifying the correlates of indecision is important to help career practitioners build up a more complete profile of the vocationally undecided student so that specific help can be given (Sepich, 1987).

Research linking ability to indecision has proven inconclusive (e.g., Taylor, 1982; Lunneborg, 1975; Taylor & Betz, 1983); however, several studies have found anxiety to be correlated to indecision. Findings from a study by Hawkins, Bradley and White (1977) suggest that a student's general anxiety was related to their level of decidedness. Their findings have also been substantiated by other studies. For example, using four measures of indecision and four measures of anxiety, Fuqua et al. (1987, p. 175) found that a 'substantial, unidimensional relationship exists between the two sets of measures' suggesting that anxiety is linked to indecision. As anxiety is a major

area of study on its own and is also linked to general indecisiveness, it is beyond the scope of the present study and will not be discussed here.

Personality variables that have been found to relate to career indecision include external locus of control and fear of success (Taylor, 1982); and self-esteem (Barrett & Tinsley, 1977). Career indecision has also been found to relate to problem-solving. Larson and Heppner (1985) examined problem-solving appraisal and career indecision, and found that self-perceived positive problem-solvers reported less feelings of external locus of control related to indecision and perceived greater relationship between their ability and occupational choice compared to self-perceived negative problem-solvers. They suggest that problem-solving deficits may impede the use of career resources. Therefore attention needs to be paid to these individual differences variables in order to accurately develop interventions for students.

Osipow and Reed (1985) found that career decision-making style is significantly related to career indecision. Using the Johnson Decision Making Inventory, they found that the most undecided were spontaneous external, followed by spontaneous internal, systematic external, and systematic internal, who were the least undecided. The researchers conclude that if undecided individuals consistently display one style of decision-making, efforts to modify career decision-making style may result in more decidedness. However, this suggestion for further research has not been followed up by other researchers. Instead, much research has been focused on another correlate of career indecision, namely career decision-making self-efficacy. As career decision-

making self-efficacy (CDMSE) is an important correlate of career indecision because of its potential for informing interventions for career indecision, it will be discussed in a separate section.

Several studies investigating the link between gender and career indecision yielded mixed results. On one hand, some studies reported that gender is not related to career indecision (eg., Neice & Bradley, 1979; Lunneborg, 1975; Osipow, 1990; Taylor & Popma, 1990); on the other hand, findings from other studies (e.g., Gianakos, 1995; Gati, Osipow & Givon, 1995) suggest that gender affects career decisions (e.g., in the alternatives considered and in eventual choices) although these effects do not consistently appear in the level of decidedness among students (Krieshok, 1998). It may be possible that the effects of gender on career indecision are more apparent in cultures where female students are not given the same opportunities to make career decisions as men (Mau, 2000). These inconclusive findings merit further investigation. Furthermore, Gati et al. (1995) argue that should gender differences exist, they must be recognised by both researchers and career counsellors so that appropriate interventions can be tailored to the student's needs. Therefore, one of the aims of the present study is to investigate whether gender affects intervention outcomes among college students in Malaysia. Gender will be discussed in greater detail in the next chapter.

2.3.2. Assessing career indecision

Another major focus of research in career indecision is its assessment. The

number of measures developed to measure career indecision reinforces the importance of understanding and identifying the extent of the problem faced by students in order for interventions to take place. As findings consistently show that students who are undecided about a career or course of study are not a homogenous group (Gordon, 1982; Holland & Holland, 1977), finding out if they are undecided is but a first step in helping students along in their decision-making process.

Various measures have been developed to measure career indecision. Earlier measures of career indecision were developed with the intention of improving practice, for example, to assist career counsellors to come up with an intervention plan for students. These measures include My Vocational Situation (MVS) developed by Holland, Diager and Power (1980, cited in Osipow, 1999) and the Career Decision Scale (CDS) developed by Osipow et al. (1976). MVS identifies difficulties related to three areas: vocational identity, occupational information and career barriers. The CDS attempts to identify specific sources of career indecision. Factor analyses in several studies reveal that the items on the CDS were not independent but could be separated into four factors: a lack of structure and confidence, approach-approach conflicts, perceived external barriers to preferred choice, and personal conflict (Sepich, 1987). However, there has been some controversy as to whether these four factors were accurate or even existed. Most users of this instrument, however, do not rely on the factor structure but rather on the total indecision score as an index of an individual's level of career indecision (Osipow, 1999). In addition, individual items on the scale can be used by career counsellors to

identify the specific problems that students face. This scale has since been used in many studies and has been found to be valid and particularly useful in predicting career indecision (e.g., Hartman et al. 1983; Taylor & Betz, 1983; Taylor & Popma, 1990). Many intervention studies also used the CDS as a screening measure for participants in intervention and comparison groups.

Another approach to measuring career indecision is Harren's Assessment of Career Decision-Making (1976). He used Tiedeman and O'Hara's (1963, cited in Harren, 1979) framework for career development as a basis for this scale. Later instruments, such as the Careers Factors Inventory by Chartrand, Robbins, Morrill and Boggs (1990) and the Career Decision Profile by Jones (1989), approach career indecision as multidimensional, thereby allowing a 'more precise diagnosis of the causes of career indecision than do the earlier measures' (Osipow, 1999; p. 150). A multidimensional approach to career indecision assumes that career indecision is made up of a group of problems rather than a single type of problem with different symptoms. These instruments sought to uncover the different types of problem faced by the decision-maker and may therefore be more effective in counselling interventions (Osipow, 1999).

One instrument that has been receiving much attention in the research literature lately is the one developed by Gati, Krausz and Osipow (1996) called the Career Decision Difficulties Questionnaire (CDDQ). Unlike earlier measures, this instrument was constructed to examine a theoretical taxonomy of career decision-making difficulties encountered in the career decision-making

process. The development of a theoretical taxonomy of career decision-making difficulties appears to be a response to the issue of the lack of career theory in the area of career indecision research as highlighted by Hall (1992). The taxonomy of career decision-making difficulties and the instrument that was developed to measure it will be discussed at length in the next section.

In summary, several problems have been identified with research in the area of career indecision. There are multiple definitions of the term without a single widely accepted one and there are disagreements as to how it should be viewed. Other problems include a lack of developmental framework and a lack of career theory. However, career indecision remains an important area of research within career decision-making because career practitioners are increasingly presented with students who are unable to make career decisions and there is a real need for solutions to assist them.

In order to produce a more complete profile of the vocationally undecided student, researchers have explored various correlates of career indecision. In research on career indecision and its correlates, several correlates were identified to be significantly related to career indecision. One such correlate is career decision-making self-efficacy that has spawned much research interest because of its utility in interventions to reduce indecision. This will be discussed as part of a greater research framework later. In research on assessing or measuring career indecision, more robust instruments have been developed to aid in interventions compared to initial instruments. One such instrument is the Career Decision Difficulties Questionnaire (CDDQ) that has

tremendous application in career indecision interventions. The next section discusses the CDDQ within research on a theoretical taxonomy of career decision-making difficulties.

2.4 Career decision-making difficulties

Research on career decision-making difficulties appears to have arisen from the assessment of career indecision. Although various instruments have been developed to measure career indecision with the aim of identifying specific problems students face in making career decisions, there has been little effort to relate research on career indecision to the decision-making process and to develop a theoretical context for the construct of indecision (Gati et al., 1996; Hall, 1992).

According to Gati et al. (1996), one of the central aims of career counselling is to help students overcome the difficulties they face during the career decision-making process. Therefore identifying the difficulties that prevent individuals from reaching a decision is a fundamental step in providing them with the help they need. Thus, career decision-making difficulties can be defined as the difficulties or problems faced in the decision-making process (Gati et al., 1996). It must be noted that career indecision and decision-making difficulties are different constructs. Research on career indecision encompasses a wider area in which identifying sources of career indecision (i.e., decision-making difficulties) is one line of research within career indecision.

As previous instruments developed to measure career indecision were constructed on the basis of assisting or informing practice, Gati et al. (1996) sought to develop a model of difficulties in career decision-making that combined both a theoretical framework and empirical testing with the aim of increasing our understanding of career indecision and assisting career counsellors in identifying problems related to career indecision experienced by the student.

Relying on decision theory, Gati et al. (1996) developed a model of the 'ideal career decision maker.' According to decision theory (Gati et al., 1996), a rational decision maker should choose the alternative with the highest utility. Therefore an ideal career decision maker is an individual who is capable of making the 'right' decision (the right decision is one that is most compatible with the individual's goals). Gati et al. (1996) defined any deviation from the ideal career decision-maker as a potential problem that may prevent the individual from making a decision or lead him or her to a less than optimal decision.

According to Gati et al. (1996), one of the questions raised by empirical research on the various career indecision measures concerns the dimensionality of career indecision. Some researchers approach career indecision as multidimensional, while others, as unidimensional. However, rather than focusing on the dimensionality of career indecision, Gati et al. (1996) approached career indecision with the practical aim of assisting career counsellors to identify the types of difficulties faced by students. Determining

the sort of difficulties that students face has direct implications for counselling and interventions (Sepich 1987). They therefore proposed a taxonomy of various difficulties that make up this construct with the underlying assumption that career indecision is made up of a group of problems that typically lead to the same outcome (i.e., career indecision).

Based on responses from 200 career counselees and 10 expert career counselling psychologists, a list of difficulties was compiled and compared with the theoretical model above. This resulted in a taxonomy that is hierarchical in which broad categories of difficulties were separated into categories and then subcategories. The first broad category, *lack of readiness*, includes difficulties that students encounter prior to beginning the process of making a career decision, while the second and third broad categories, *lack of information* and *inconsistent information*, include difficulties that arise during the process of career decision-making (Gati et al., 1996).

This taxonomy of career decision difficulties appears to be compatible with previous research on indecision in that it encapsulates the difficulties found in other research. For example, the factor 'lack of confidence and structure' measured by the CDS is included in this taxonomy in the major category *lack of readiness*, while two factors of the Careers Factors Inventory (lack of knowledge about self and occupations) are represented by the subcategories 'lack of information about self and occupations' within the major category *lack of information* (Gati et al., 1996).

Based on this taxonomy, the Career Decision Difficulties Questionnaire (CDDQ) was developed. The CDDQ assesses an individual's difficulties at three levels of specificity: three major categories (*lack of readiness, lack of information* and *inconsistent information*); and 10 categories of specific difficulties (Gati et al., 1996). It was pilot-tested with two samples (American and Israeli) and in light of the findings from these two samples, some revisions to the taxonomy were made (Gati et al., 1996). The 44-item questionnaire was shortened to 34 items by Gati and Saka in 2001 (the abbreviation for this instrument used in this thesis is CDDQr).

There may be some overlap between the CDS and the CDDQ because the CDDQ, as a later instrument, attempts to capture the decision-making difficulties identified in earlier research. However, the CDS differs from the CDDQ in several ways. First of all, the CDS contains a Certainty Scale that measures whether a student has made a decision, and the CDS gives an overall index of career indecision, whereas the CDDQ measures the types of difficulties faced when making career decisions. However, these two scales are highly correlated, indicating that students who have high levels of career indecision also perceive greater difficulties in making career decisions (Osipow & Gati, 1998). To investigate the construct and concurrent validity of the CDDQ, Osipow and Gati (1998) also examined the empirical relations of the CDDQ with another established measure associated with career indecision – the Career Decision Self-Efficacy Scale (CDSES) by Taylor and Betz (1983). Their study shows that career decision-making difficulties are moderately negatively related to career decision-making self-efficacy, indicating that

students who perceive greater difficulties in making career decisions also have lower confidence in carrying out activities necessary in making career decisions.

Various studies have also been carried out to check the validity of the CDDQ as an instrument to measure career decision-making difficulties. Findings of several studies provided evidence of construct validity for the instrument with college students in the USA (Lancaster, Rudolph, Perkins & Patten, 1999; Osipow & Gati, 1998; Gati et al., 2000), and with high school students in Israel (Gati & Saka, 2001a) and Australia (Albion & Fogarty, 2002). However, Mau (2001) found that the taxonomy fits less well with Taiwanese students suggesting that the structure of decision-making difficulties may vary as a function of cultural differences. For instance, in his study, using path analyses, he found that a *lack of information* had a greater impact on career indecision for Taiwanese students, whereas a *lack of readiness* had a greater impact on career indecision for American students. His findings suggest that culture may be a significant factor in career decision-making. In a later study, Mau (2004) investigated racial and ethnic differences in career decision-making difficulties and found that Asian-American students perceived significantly more difficulties than other groups. Mau's studies have important implications for the present study because his findings suggest that students in different cultural contexts may experience different types of difficulties, thus further strengthening the claim that vocationally undecided students are not a homogenous group (Gordon, 1982).

Furthermore, in a study by Zhou and Santos (2007) using the CDDQ with British and Chinese international students studying in two British universities, it was found that Chinese students were significantly less ready to make career decisions compared to their British counterparts, and male students had fewer difficulties compared to female students. An interesting finding of this study is that there were no significant gender differences among the Chinese participants; however, such differences existed among British participants in that female students reported significantly more difficulties than male students in all three categories of difficulties. Zhou and Santos (2007) proposed that the reason for this could be that the female Chinese participants in their study were mostly postgraduate students who might not necessarily occupy traditional female roles in China.

It must be noted that the taxonomy of career decision-making difficulties by Gati et al. (1996) focuses on information- and cognitive-related career decision-making difficulties (Saka & Gati, 2007). In addition to these difficulties, Amir and Gati (2006) propose that college students also face career decision-making difficulties that stem from emotional and personality-related sources which may be more severe than information-related difficulties (Saka & Gati, 2007). Saka, Gati and Kelly (2008) developed a theoretical framework for analysing the emotional and personality-related aspects of career decision-making difficulties. Their model comprised of three major clusters, namely, pessimistic views, anxiety, and self-concept and identity. They developed the Emotional and Personality Career Difficulties Scale (EPCD) and tested it initially with a sample of Israeli students. Their study provided evidence of

cross cultural validity of the model using a sample of American college students. Using the EPCD and four personality measures (namely, general indecisiveness, self-esteem, trait anxiety, and identity status), Saka and Gati (2007) found that individuals with high EPCD scores at the beginning of the academic year had less confidence in their choice and were less close to making a decision about a major at the end of the year.

While the emotional and personality-related aspects of career decision-making difficulties are not explored as they are beyond the scope of the present study, this area of research demonstrates that decision-making difficulties are not limited to information- and cognitive-related aspects only. According to Saka and Gati (2007), accurate assessment of career decision difficulties has important implications for career intervention because it permits the development of differential interventions for clients with different types of difficulties.

In conclusion, as many college students experience career indecision, the first step to assist them is to identify, define and categorise the nature of their difficulties. Research on career decision-making difficulties by Gati et al. (1996) has resulted in a theoretical taxonomy of career decision-making difficulties and the development of a robust, theoretically-based instrument to measure career decision-making difficulties. For the purposes of the present study, the CDS is considered a useful overall measure of career indecision, while the CDDQ provides a detailed picture of the types of difficulties encountered. Career decision-making difficulties have also been found to be

moderately negatively related to career decision-making self-efficacy. As there is much research on interventions to modify career decision-making self-efficacy in the expectation that this will reduce indecision, it is hypothesised that by increasing career decision-making self-efficacy, career decision-making difficulties will also be reduced. To my knowledge, this has not been explored by other researchers in interventions targeted at reducing indecision except for one study by Fouad et al. (2009). Career decision-making self-efficacy will be discussed at length in the next section.

Cultural differences and mixed results regarding gender and decision-making difficulties suggest that further research is necessary. These will be discussed at length in the next chapter.

2.5 Career decision-making self-efficacy

Early approaches to career interventions were based on several dominant career development theories. Holland's (1985) and Dawis and Lofquist's (1984) 'person-environment fit' theories posit that congruence between personality and the demands of the work environment will determine occupational success and satisfaction (Hackett & Lent, 1992). These early theories were concerned with the occupation that a person eventually chooses or the *content* of career choice.

On the other hand, developmental and social learning theories are concerned with the *process* of career development rather than the outcome of career

choice (Hackett, 1995). The focus of Super's (1990) developmental theory is on how individuals manage or negotiate career development tasks across their life span. The social learning theory by Mitchell and Krumboltz (1990) seek to describe the mechanisms where career interests, values, beliefs and skills are learned.

More recently, cognitive theories that emphasise the role of personal agency in shaping one's career direction have been given greater importance in career development literature because of their potential for informing career interventions. Research shows that perceived self-efficacy exerts a strong, direct influence on many aspects of career development (Bandura, 1986; Betz & Hackett, 1986).

Originally proposed by Bandura (1977) within his social cognitive theory, perceived self-efficacy can be defined as 'beliefs in one's capabilities to organise and execute the courses of action required to produce given attainments' (p. 3). According to Bandura, self-efficacy beliefs influence the course of action people choose to pursue; how much effort they will expend; how long they will persevere when faced with obstacles and failures; and how much they will eventually accomplish.

Betz and Hackett (1981; Hackett & Betz, 1981) first explored the utility of self-efficacy in understanding women's career development. They hypothesised that perceived self-efficacy plays a more powerful role than interests, values, and actual abilities in the pursuit of careers. Hackett and Betz's model was

empirically tested by Betz and Hackett (1981). Their findings reveal that self-efficacy expectations were related to the nature and range of occupational alternatives perceived by male and female undergraduates. Specifically, there were gender differences in self-efficacy expectations with regard to the educational requirements and job duties of traditionally female and male occupations. Female students reported significantly higher levels of self-efficacy with regard to traditional occupations, such as secretary and home economist, and significantly lower levels of self-efficacy with regard to non-traditional occupations, such as engineer and mathematician. Results from this study were strongly supportive of the role of perceived self-efficacy in influencing the career choices of female college students, and the usefulness of self-efficacy theory in understanding women's career development (Hackett, 1992).

Since the work by Betz and Hackett (1981), self-efficacy theory has been applied to the understanding of other facets of career behaviour. Research on self-efficacy within the career development context can be divided into two major areas: the role of perceived self-efficacy in determining the *content* of career choice, and the role self-efficacy plays in the *process* of career decision-making. Career choice *content* refers to content domains such as mathematics and science (Betz, 1992). Low self-efficacy in a content area would lead to avoidance of that subject area or careers. Career *process* domains refer to the behavioural domains that are important to the choice and implementation of any career area (Betz, 1992). Early researchers have mostly focused on the former. For example, in a study by Hackett (1985), it was found that self-

efficacy expectations predicted grades and persistence in technical and scientific majors. Students who have strong efficacy beliefs in their ability to succeed in mathematics and science would consider and persist in scientific and technical majors in college compared to those with weaker mathematics and science efficacy beliefs. This finding is supported by other studies such as Brown, Lent and Larkin (1989), and Lent, Brown and Larkin (1987).
Self-efficacy beliefs were also found to be related to vocational interests. The stronger the self-efficacy beliefs, the more interest students express in a given occupation (Betz & Hackett, 1981). Lent et al., (1987) posit that careers interests are not likely to be developed in areas where perceived self-efficacy is weak, and even if developed, individuals will not persist in them. They found that interests and self-efficacy predicted the range of career options considered, but self-efficacy was the stronger predictor of academic achievement and persistence.

In recent literature, researchers have focused their efforts on investigating the role self-efficacy plays in the *process* of career decision-making. Like content domains, Hackett and Betz (1981) hypothesised that self-efficacy also plays a role in process domains. Specifically, they posit that self-efficacy expectations influence behaviours that are necessary for the creation and pursuit of career options as well, such as behaviours orientated towards the acquisition of career-related skills. If an individual has lower perceived self-efficacy in behaviours that are critical to 'effective and satisfying choices, plans, and achievements,' these behaviours are less likely to be initiated and even if initiated would be less likely to be sustained in the face of obstacles and

failures (p. 329). Taylor and Betz (1983) hypothesised that weak decision-making self-efficacy would inhibit career exploratory behaviour and the development of decision-making skills, and thus may be predictive of career indecision and other problems in career decision-making. Thus career decision-making self-efficacy (CDMSE) can be defined as an individual's belief or confidence that he or she is able to carry out tasks specific to making career decisions (Taylor & Betz, 1983).

Combining Bandura's concept of self-efficacy and Crites's (1978) Career Maturity Theory, Taylor and Betz (1983) developed the Career Decision Self-Efficacy Scale (CDSES) to measure self-efficacy expectations with regard to completing tasks and behaviours specific to making career decisions. Crites's (1978) model of career maturity provided Taylor and Betz (1983) with the framework for defining and operationalising the skills required in career decision-making. Crites (1978) postulates that good career decisions are facilitated by five career choice competencies which include (a) accurate self-appraisal, (b) gathering occupational information, (c) goal selection, (d) making plans for the future, and (e) problem-solving. The five subscales of the CDSES are based on these five competencies. The CDSES have been shown to be highly reliable and to be strongly related to criterion measures such as career indecision, as measured by Osipow et al.'s (1976) Career Decision Scale (CDS). As this scale contains 50 items, it was subsequently revised and shortened by Betz, Klein and Taylor (1996) so that it could be used as a pre- and post-test measure in evaluating effectiveness of career interventions. The

revised scale is called the Career Decision Self-Efficacy Scale – Short Form (CDSES-SF).

Using the CDSES and the CDS (as a measure of career certainty and indecision), Taylor and Betz (1983) found that students who had higher levels of career indecision reported lower self-efficacy in completing tasks necessary for making career decisions. CDMSE was also found to be a major predictor of career indecision. In Taylor and Popma's (1990) study of 407 college students, they found that CDMSE was moderately and negatively related to vocational indecision, indicating that the more undecided the students was, the lower his or her career decision-making self-efficacy expectations. Conversely, students who were more vocationally decided expressed more confidence in their ability to complete career decision-making tasks.

Mathieu, Martineau & Tannenbaum (1993) reported that undecided female college students had significantly lower CDSES scores compared to female students preferring male-dominated or gender-neutral occupations. Neville and Schlecker (1988) found that female students who scored high on the CDSES were more willing to engage in career-related activities of non-traditional occupations compared to female students who scored low on the CDSES. Other studies such as Robbins (1985), Bergeron and Romano (1994), Betz and Voyten (1997) also provide support that CDMSE (as measured using the CDSES) is significantly related to career indecision.

Research also shows that CDMSE to be strongly related to career decision-making difficulties (Osipow & Gati, 1998; Amir & Gati, 2006). In the study by Osipow and Gati (1998), students who reported greater decision-making difficulties also reported lower levels of CDMSE. Similar findings were recorded by Amir and Gati (2006), suggesting that students with fewer difficulties in making career decisions also have higher levels of self-efficacy in carrying out tasks specific to making those decisions. These findings are significant for the purposes of the present study because they show how closely these three constructs (career indecision, career decision-making difficulties and CDMSE) are related but there is a paucity of research that relate these three constructs, and explain how they affect one another. A deeper understanding of the relationships among these constructs is important in the design and development of career interventions. This is explored in greater depth in section 3.2.4.1 in the next chapter.

In addition to career indecision and decision-making difficulties, studies have found strong relations between CDMSE and a number of career-related constructs, suggesting that self-efficacy plays an important role in the career decision-making process. For example, CDMSE is related to career maturity (Anderson & Brown, 1997; Luzzo, 1993), career exploration behaviour (Blustein, 1989), academic and social integration (Peterson, 1993), career decision-making style (Mau, 2000), vocational identity (Robbins, 1985), locus of control (Taylor & Popma, 1990), patterns of career choices (Gianakos, 1999), and family interaction patterns (Hargrove, Creagh & Burgess, 2002) among others.

In more recent studies, Walker and Tracey (2012) investigated the relations of future-orientation (i.e., valence and instrumentality), CDMSE and career indecision, and found that instrumentality was positively associated with CDMSE. They found that individuals who tended to think about how their present activities connected with future goals reported higher CDMSE. Also, there were significant mediation effects between instrumentality and choice/commitment anxiety and lack of readiness, accounted for by CDMSE. Individuals who understand the important relation between present steps and future goals tended to have higher CDMSE, which in turn leads to decreased anxiety about choosing and committing to a career, and a decrease in the sense of being unprepared (Walker & Tracey, 2012). The researchers suggest that interventions that help students develop a sense of time perspective may stimulate increases in CDMSE and to guard against indecision. Although the role of future time perspective was not explored further as it is beyond the scope of the present study, elements of this concept were integrated into the career course in section 5.7.3.

In summary, CDMSE is a theoretically-based construct that can be measured effectively using the CDSES or CDSES-SF, and is particularly useful in the evaluation of interventions which will be discussed in the next chapter. This construct has been examined extensively in research literature and many researchers have concluded that it is useful in providing insights into the career decision-making process.

2.6 Chapter summary and conclusions

A review of research literature concerning career decision-making reveals that the career decision-making process is a complex one and researchers have sought to give this area more clarity by focusing on models to describe it and the various decision-making styles. In addition, much focus has been given to identifying correlates of career indecision and assessing this construct. CDMSE is an important correlate of career indecision and can be measured effectively by the Career Decision Self-Efficacy Scale and its short form (Taylor & Betz, 1983; Betz et al., 1996). Two instruments that have received much research attention are the Career Decision Scale (Osipow et al., 1976) and the Career Decision Difficulties Questionnaire (Gati et al., 1996).

The review of literature also reveals that career indecision, career decision-making difficulties and CDMSE are important constructs to be investigated because of their usefulness in the development of career interventions and in evaluating the effectiveness of interventions to help undecided students. However, there are few studies that relate all three constructs. Therefore, research that relate all three constructs is necessary to understand how they affect one another as this has important implications for intervention research.

The next chapter focuses on a review of literature concerning career interventions and gender in career decision-making.

CHAPTER 3 – CAREER INTERVENTIONS: A REVIEW OF LITERATURE

3.1 Chapter overview

The chapter describes how interventions have been developed to modify career decision-making self-efficacy (Section 3.2). Critical components of career interventions, and career courses are discussed at length in Sections 3.3 and 3.4 respectively. Gender is discussed in detail in Section 3.5. This is then followed by a summary of the findings and the gaps of knowledge identified in the review that this investigation hopes to fill. The chapter then concludes with the research aims, research questions and hypotheses of the present study.

3.2 Career interventions

Fouad and Bingham (1995) define 'career counselling or career intervention' as a 'process, one occurring between two (or more) individuals and designed to help clients reach a career decision' (p. 333). According to Niles and Harris-Bowlsbey (2002), career development interventions involve 'any activities that empower people to cope effectively with career development tasks' (p. 16). One such task is making career decisions. For the purposes of the present study, career interventions that are discussed here refer to activities to help undecided students in their career decision-making process.

Career interventions are an important area of investigation within career decision-making research because vocational psychologists and career counsellors are constantly looking for solutions to help undecided students (Osipow, 1999; Fouad, 1994).

Therefore, given the findings regarding career decision-making self-efficacy and its related career constructs particularly career indecision and career decision-making difficulties, researchers investigated if CDMSE can be enhanced through interventions with the expectation that by enhancing career decision-making self-efficacy, career indecision will also be reduced. From previous findings in literature, it was also expected that by increasing CDMSE, students will have fewer difficulties making career decisions. Reducing career indecision and career decision-making difficulties are clearly goals for career practitioners as undecided students need help in making course and career decisions.

While several studies have shown that career interventions can be successful at increasing an individual's efficacy for making career decisions, less is known about the actual mechanisms that bring about this change. Betz (2000) proposes that successful career interventions are those that are based on the sources of self-efficacy. Within the theoretical context of self-efficacy, Bandura (1986) postulates that the 'knowledge of one's efficacy is based on four principal sources of information: (a) performance attainments; (b) vicarious experiences of observing the performance of others; (c) verbal persuasion and social influences; and (d) physiological and emotional states

from which people judge their capabilities, strengths and vulnerability to dysfunction' (p. 399). Bandura (1986) posits that prior successful personal performance accomplishments in a specific task will enhance one's confidence and interest in that task. Vicarious or observational learning refers to being identified with and learning from people who have succeeded in accomplishing a career development task. The third source of efficacy information is verbal persuasion and social influences where the individual's self-efficacy beliefs are strengthened by expressions of belief in the person's capabilities. Lastly, self-efficacy beliefs are influenced by our emotional and physiological states.

Thus, Betz (2000) suggests that the self-efficacy construct not only provides a means for understanding the development of self-efficacy beliefs but also the means for their modification through interventions incorporating positive applications of the four sources of efficacy information. Interventions are therefore presumed to be most effective when they provide the participants with exposure to or participation in the four sources of self-efficacy proposed by Bandura (Betz, 2000).

Lent, Brown and Hackett (1994, 1996) expanded on Bandura's (1986) social cognitive theory in their social cognitive career theory (SCCT) to describe and explain the role of individual, environmental and contextual factors that contribute to a person's learning experiences that serve as a basis for developing self-efficacy and outcome expectations. These self-efficacy and outcome expectations lead to the generation of interests, goals and performance. This is described within Bandura's triadic model of causality

which assumes that personal attributes, the environment and behaviours affect one another bi-directionally (Lent et al., 1996). SCCT is a useful framework for helping researchers understand the role of self-efficacy in career behaviours. Another advantage of SCCT is that its elements can be used to develop assessments and interventions for career development (Gainor, 2005). While some researchers state explicitly that their interventions are based on SCCT (e.g., Grier-Reed & Skaar, 2010), others do not but instead refer to Bandura's social learning theory in which the SCCT is rooted. Whether or not interventions are based on SCCT, it is clear that many researchers within the area of career development base their interventions on one or more of the four sources of information proposed by Bandura (1986) on which self-efficacy is modified in order to enhance CDMSE.

As many studies have shown that interventions incorporating one or more of these four sources of efficacy information have resulted in positive outcomes, only studies that incorporate these four sources of self-efficacy information to modify self-efficacy beliefs (as proposed by Bandura, 1986) in career decision-making have been chosen for review. Studies that do not use the sources of self-efficacy proposed by Bandura (1986) and studies that explore content-specific domains (e.g., self-efficacy in mathematics, writing, scientific and technical careers among others) have been excluded. Although college students have been chosen as the target population for the present study, studies involving both college and high school students have been included for review because there are a few studies involving high school populations that have demonstrated the effectiveness of social cognitive-based approaches in

increasing CDMSE (e.g., McWhirter, Rasheed & Crothers, 2000, and O'Brien et al., 2000).

In summary, the intervention studies for review were chosen on the basis that they contain the following elements:

1) An investigation of at least one of the three constructs, namely career decision-making self-efficacy, career indecision and career decision-making difficulties
2) The use of at least one the following instruments to measure the above constructs, namely the CDSES, CDS and CDDQ
3) Exposure to or participation in one or more sources of self-efficacy proposed by Bandura
4) High school and college students sample population.

A total of 12 studies were chosen for review. Three studies examined brief interventions incorporating one or more of the sources of self-efficacy to modify self-efficacy beliefs in career decision-making and reported increases in CDMSE; two studies investigated the use of career assessments and interest inventories; two studies examined computer-assisted guidance systems; and four studies investigated longer interventions to increase CDMSE, two of which involved high school student samples. One longitudinal non-intervention study was also included for review in this section as it examined the relationship between CDMSE and career indecision, which is crucial to intervention research as it has implications for the design and development of suitable interventions for students.

3.2.1 Brief interventions

Luzzo and Taylor (1994) evaluated the effects of verbal persuasion on the CDMSE scores of first-year college students and found significant gains in CDMSE scores of students who received verbal persuasion compared to students in the control group. The 50-item CDSES by Taylor and Betz (1983) was used as the pre- and post-test measure. In their study, students completed the World of Work Inventory (WOWI by Ripley and Neidert, 1987, cited in Luzzo and Taylor, 1994), a career assessment tool that includes sections on career interest activities, job satisfaction indicators and vocational training potentials, and met with a career counsellor to discuss their results. During the feedback session, the counsellor persuaded students that they possess the ability to acquire the requisite skills for effective career decision-making. Students in the treatment group completed the CDSES after the feedback session while students in the control group completed the CDSES before the feedback session. Students in the treatment group recorded significant increases in CDMSE scores while the scores of students in the control group remained unchanged, thus showing that verbal persuasion was effective in increasing CDMSE.

In an attributional retraining procedure by Luzzo, Funk and Strang (1996), it was found that the CDMSE scores of students who initially exhibited an external locus of control increased significantly following the attributional retraining procedure. This intervention involved watching an eight-minute videotape in which a female and male college graduate described their career

development over the course of their late adolescent and early adult years. These graduates persuaded students to attribute their career-related difficulties to a lack of effort and to believe that successful career development was dependent on persistence. The findings of this study show that attributional retraining through verbal persuasion appears to be an effective method for increasing CDMSE of college students who initially exhibited an external locus of control. However, attributional retraining offers little advantage to students with an internal locus of control. Therefore, the researchers conclude that not all career-related difficulties are a result of a lack of effort so a blanket approach to intervention could be counterproductive. Although gains achieved through the attributional retraining were maintained after a two-week period, the researchers felt that the change may be a temporary one and suggested longitudinal studies to ascertain intervention effects over time.

Foltz and Luzzo (1998) carried out a career planning workshop for non-traditional college students (defined as undergraduates over 25 years of age) that incorporated the four sources of efficacy expectations in the two-hour workshop. The activities of the workshop incorporated 'encouragement, anxiety reduction, exposure to successful models and sharing of successes to parallel Bandura's conceptions of verbal persuasion, emotional arousal, vicarious learning and performance accomplishments' (p. 39). College students were randomly assigned to either an experimental treatment group or a delayed-treatment control group. Results indicate that those in the treatment group exhibited increased scores on the CDSES compared to those in the

delayed-treatment group. They also found that participants' age, gender, year in college, and family income did not influence the increases in CDMSE.

These studies show that college students' career self-efficacy can be enhanced through relatively brief interventions that allowed participants to be exposed to or participate in the sources of information proposed by Bandura (1986) on which self-efficacy is modified.

3.2.2 Use of career assessment tools

Luzzo and Day (1999) investigated the effects of the use of career assessment and interest inventory, the Strong Interest Inventory (SII) in combination with a social cognitive-based group feedback and interpretation session. They hypothesised that completing the SII and engaging in the feedback process provided a direct source of performance accomplishments and verbal persuasion, and will lead to increases in CDMSE. In their study, participants were randomly assigned to three experimental groups: the SII with feedback group, the SII completion only group, or the control group. Students who completed the SII and participated in the feedback session displayed significant increases in CDMSE relative to those in the other two conditions. Their study provided support not only for the use of two of Bandura's sources of information to modify self-efficacy beliefs, but also that the use of vocational assessment inventories, such as the SII, may produce more optimal results if integrated within a comprehensive career intervention programme compared to

using these tools in isolation, ie, 'without a theoretically-driven system of feedback and interpretation' (p. 14).

Uffelman, Subich, Diegelman, Wagner, and Bardash (2004) extended Luzzo and Day's (1999) study to include another career interest assessment instrument, the Self-Directed Search (SDS) by Holland, Fritzche & Powell, (1994). They evaluated four combinations of self-administered assessment and counsellor interpretation to increase CDMSE: (1) SDS followed by an interpretative session with a counsellor (2) student and counsellor worked through the SDS together over two sessions (the researchers term this treatment as process-oriented assessment/interpretation of the SDS) (3) SII followed by interpretative session with a counsellor, and (4) no-treatment control group. The CDSES was used as the pre- and post-test measure. Significant increases in CDMSE were observed for participants in all treatment groups but the pre-post changes in CDMSE did not differ significantly among the three groups. Greater treatment gains reported by the two SDS groups suggest that as a career assessment and interest tool, the SDS required participants to exert more effort in thinking through the items in this tool (compared to the SII), thereby affording the participants more opportunities to increase their performance accomplishments because any learning will be attributed to the participants' own effort. Overall, their study provided support for the use of career assessment and interest inventories in increasing CDMSE as they provide participants with performance accomplishments, one of Bandura's four sources of information through which self-efficacy is developed and modified. Their

study also examined other critical ingredients in a career intervention but this will be discussed in the next section.

In summary, these studies show that career assessment instruments provided participants with performance accomplishments which resulted in increased CDMSE. Again, these studies provided empirical support for the effectiveness of interventions that emphasise the sources of self-efficacy proposed by Bandura (1986).

3.2.3 Computer-assisted career guidance systems

Some researchers examined computer-assisted career guidance systems to increase CDMSE and reported success. Fukuyama, Probert, Neimeyer, Neville and Metzler (1988) assessed the impact of interactive computer guidance program DISCOVER on students' CDMSE and career indecision. The DISCOVER program provides 'self-assessments in the areas of interests, values, and abilities and supplies occupational information pertaining to over 400 occupations' (p. 58). A total of 77 students in their first or second years of college in undeclared majors volunteered for the study and were given extra credit. Participants attended an initial orientation and pre-test session before being randomly assigned to either the treatment or control groups, and were scheduled to return to work on the DISCOVER program. Participants in the control group completed the assessment measures (CDSES and CDS) just before using the DISCOVER program while participants in the treatment group completed the assessment measures after using the DISCOVER program.

Participants in the treatment group had significant increases in their CDMSE scores and reported more career decidedness at post-test. Thus, the results indicate that DISCOVER had a positive effect on increasing CDMSE and reducing career indecision. Their study also provided support that CDMSE is a construct that can be enhanced through interventions. Although Fukuyama et al (1988) did not explicitly relate components of DISCOVER to Bandura's four sources of information to modify self-efficacy beliefs, a later study by Maples and Luzzo (2005) expanded on the study by Fukuyama et al. (1988) by evaluating the individual and combined effects of DISCOVER and career counselling on participants' CDMSE and career decision-making attributional style.

Maples and Luzzo (2005) examined the effects of DISCOVER individually and in combination with career counselling to increase CDMSE and investigated career decision-making attributional style. Participants were randomly assigned to one of four groups: (1) control group (no intervention between pre-test and post-test) (2) DISCOVER only group without counselling (3) counselling-only group, and (4) combined treatment group (DISCOVER and discussion with a counsellor regarding role of interests, abilities and values in career decision-making). The results indicate that DISCOVER enhances CDMSE and the sense of control over the career decision-making process of college students. The researchers propose that completing the DISCOVER program, that took approximately one hour, provided participants with opportunities for performance accomplishments (one of the four of Bandura's sources of self-efficacy). Participants in the counselling only and counselling in

combination with DISCOVER groups (as well as the control group) did not report increases in CDMSE or attributional style. The researchers explain that a single counselling session may not provide sufficient opportunities for vicarious learning, and may not include verbal encouragement for engaging in career exploration and planning. The small sample size (e.g., 8-9 students in each group) may have also contributed to the lack of treatment effect.

In summary, these two studies provided support for the effectiveness of computer-assisted career guidance systems as a tool for providing opportunities for performance accomplishments to college students thus resulting in increases in CDMSE.

In recent years, the CDDQ was incorporated into two career-related, self-help-oriented, free Internet websites (namely www.addq.org and www.kivunim.com) to help individuals locate their career decision-making difficulties (Amir, Gati & Kleiman, 2008). Amir et al. (2008) reported that individuals' responses to the CDDQ online can be analysed and interpreted systematically based on a theoretical rationale. Their findings show that it is possible to provide computerised interpretations that are compatible with expert career counsellors. In view of the advantages of computer-assisted career guidance systems in providing help to undecided students, their findings have important implications for the usefulness of web-based systems. This will be discussed in greater detail in chapter 11 in section 11.6.

3.2.4 Longer interventions

Besides brief interventions, many studies examined longer interventions to increase CDMSE. Sullivan and Mahalik (2000) evaluated a six-week group intervention consisting of six 90-minute sessions, incorporating Bandura's four sources for modifying self-efficacy. A total of 31 women participated in the treatment group and 30 women took part in the no-treatment control group. Results indicate that compared with the control group, women in the treatment group experienced an increase in career decision-making self-efficacy and vocational exploration and commitment. These women also maintained these gains at a six-week follow-up. The findings of this study also support Betz's (1992) strategies for increasing career-related self-efficacy through addressing Bandura's four sources of information through which self-efficacy is modified. Although the researchers propose that this intervention should positively affect career indecision, this was not measured in their study. The CDS was used only as a screening measure before participation in the study. Therefore, more research is needed to determine if interventions targeted at increasing CDMSE would also result in a reduction in career indecision.

In more recent studies, Scott and Ciani (2008), Grier-Reed and Skaar (2011), and Fouad et al. (2009), evaluated career courses for college students and reported significant increases in CDMSE. These studies provide further empirical support that career decision-making self-efficacy is a malleable construct that can be increased using interventions incorporating Bandura's four sources of efficacy information. These studies as well as the studies

reviewed earlier also provide support for using the Career Decision-Making Self-Efficacy Scale (Taylor & Betz, 1983) and its shorter version, the CDSES-SF (Betz, Klein & Taylor, 2005) as valid measures of CDMSE for college students. These studies will be discussed in detail within the section on career courses in section 3.4.

Two studies investigated the effects of interventions for high school students that incorporated the four sources of information proposed by Bandura (1986) on which self-efficacy is modified. O'Brien et al. (2000) investigated the effects of a career exploration programme in increasing CDMSE for high school students who were at risk for academic and vocational underachievement. Participants in the programme met for 50 minutes, five times a week for five weeks and it was found that the programme was successful in increasing CDMSE. However, they did not find a corresponding increase in the number of occupations considered compared to the control group after the intervention. The researchers concluded that career exploration interventions would enhance and promote academic achievement among students who were at risk for academic and vocational underachievement and they should occur earlier (i.e., during middle school) to guard against premature foreclosure of occupational options.

McWhirter et al. (2000) examined the effects of a nine-week career education class for high school students on CDMSE, outcome expectations, perceived educational barriers, career expectations, and educational plans. Participants in the career education class met for 50 minutes, five times a week for nine

weeks. They found small but significant increases in CDMSE and vocational skills self-efficacy, and they attributed the increase to participants' exposure to three sources of self-efficacy expectations proposed by Bandura (1986), namely performance attainments, vicarious learning opportunities, and social persuasion experiences. They also found that these effects were 'durable' in that scores for CDMSE and vocation skills self-efficacy remained significantly higher after nine weeks than at pre-test.

In summary, these two studies show that career intervention programmes that provide students with exposure to the sources of self-efficacy expectations proposed by Bandura (1986) are effective in increasing CDMSE for high school populations.

3.2.4.1 Relationship between CDMSE and career indecision

While many studies have yielded successful results in enhancing career decision-making self-efficacy through interventions incorporating Bandura's four sources of efficacy information, few studies investigated if career indecision and CDMSE are causally related. Early researchers (e.g., Taylor & Popma, 1990; Betz & Voyten, 1997; Guay, Senecal, Gauthier & Fernet, 2003) found CDMSE to contribute significantly to the prediction of career indecision, but they in no way concluded antecedent or causal relationships between the two constructs. According to Creed, Patton and Prideaux (2006), many researchers assume that self-efficacy is causally related to career indecision, and that changes in career self-efficacy (either through maturation or

intervention) will result in changes in career indecision. One study by Grier-Reed and Skaar (2010) explored the effects of an undergraduate constructionist career course on CDMSE and career indecision. Although the roots of constructivism can be traced back to Piaget's theory of cognitive development, the researchers argue that the focus of the course on empowerment processes was also attuned to the four sources of self-efficacy proposed by Bandura's. In a pre-test post-test design using the CDSES-SF and CDS, the researchers found significant increases in CDMSE at the end of the course without any corresponding decreases in career indecision. Contrary to literature suggesting that CDMSE is predictive of career indecision, career indecision in their study remained relatively stable despite significant increases in CDMSE. However, their study did not include a control group so the researchers were not able to state conclusively that the changes in CDMSE were the effects of the intervention alone. This is the only study (to my knowledge) that measured career indecision as a treatment effect in career interventions.

In the study by Creed et al. (2006), the researchers used a longitudinal research design to examine the relationship between CDMSE and career indecision. Using the CDS as a measure of career indecision and the CDSES-SF to measure CDMSE, data were collected at two points in time. The time lag of two years between the two time points was expected to allow enough time for changes to occur. The findings of this study revealed that contrary to expectations, and in contrast to how the relationship between CDMSE and career indecision has been viewed in literature, a change in CDMSE was not associated with a change in career indecision over time, nor was a change in

career indecision associated with CDMSE over time. The researchers believe that their study provided evidence that there is no causal relationship between CDMSE and career indecision, and that these two should be viewed as distinct constructs. They also suggest that as reducing career indecision is the main focus for career practitioners, interventions should focus on tackling career indecision directly rather than focus on enhancing self-efficacy with the expectation that this will contribute to a reduction in career indecision. However, the absence of a causal relationship between career indecision and CDMSE in their study could be due to other reasons. For example, the study was carried out among high school students, and therefore may not apply to older college students (who are the target population of the present study). Younger students may not feel the urgent need to make career decisions compared to students in college who need to declare a major. Besides that, two years could be too long for changes in the relationship (if there is one) to be maintained or measured. Finally, this study did not include an intervention. Interventions may have different effects on the variables.

In summary, this study raises questions as to the true antecedents of career indecision and further research is necessary to investigate if interventions to enhance CDMSE will result in a reduction in career indecision. This is clearly a gap in literature that the present study hopes to fill. Furthermore, brief interventions (e.g., eight minutes, or two hours) may not provide the necessary time lag to examine the relationship between CDMSE and career indecision. Moreover, many studies are cross-sectional in nature, and are not able to examine causal relationships between variables. Therefore, the present study

investigates a career course that spans four weeks with data collection points over a period of three months. Career courses will be discussed in detail in section 3.4.

In conclusion, as self-efficacy expectations are developed through four sources of information based on Bandura's self-efficacy theory, they can also be modified through these same sources. Many researchers have sought to incorporate one or more of these sources of information in their interventions to increase CDMSE with some measure of success. However, although many studies have shown that interventions incorporating one or more of these sources of information are successful at increasing CDMSE, there is one study only that measured career indecision as a treatment effect of an intervention. However, because there was no control group used, the researchers were unable to attribute output effects solely to the intervention. Therefore, the causal or antecedent relationship between CDMSE and career indecision remains more hypothesised than actual. Creed et al. (2006) posit that there is no causal relationship between CDMSE and career indecision as shown by the findings of their study but since their study was conducted with high school students and did not include an intervention, further research with college students is necessary to verify this. Furthermore, career indecision is seldom measured as an output effect in studies on intervention, so there is clearly a need for more research in this area. Moreover, longer interventions provide the opportunity to measure the relationship between these two constructs. A summary of the studies reviewed in this section can be found in Table 3.1 below.

Table 3.1

Summary of intervention studies reviewed in section 3.2

Researchers	Type of intervention	Constructs investigated	Instruments used	Sources of self-efficacy information	Sample Population	Key findings
Luzzo & Taylor (1994)	Counsellor feedback	CDMSE	CDSES by Taylor & Betz (1983)	Verbal persuasion	College students	Increased CDMSE for students who completed the CDSES after receiving verbal persuasion
Luzzo et al. (1996)	Attributional retraining – 8-min video	CDMSE	CDSES by Taylor & Betz (1983)	Verbal persuasion	College students	Increased CDMSE for students who initially exhibited an external locus of control
Foltz & Luzzo (1998)	Two-hour workshop	CDMSE	CDSES (Taylor & Betz, 1983)	Verbal persuasion, emotional arousal, vicarious learning and performance accomplishments	Non-traditional college students (> 25 years old)	Increased CDMSE for participants in the treatment group
Luzzo & Day (1999)	Strong Interest Inventory (SII) in combination with a social cognitive-based group feedback and interpretation session	CDMSE	CDSES-SF (Betz et al., 1996)	Performance accomplishments and verbal persuasion	College students	Increased CDMSE for participants in the SII with feedback group
Uffelman et al. (2004)	Four combinations of self-administered assessment instruments – the Self-Directed Search (SDS) and SII, and counsellor interpretation	CDMSE	CDSES (Betz & Taylor, 1994)	Performance accomplishments	College students	Increased CDMSE for all three treatment groups but greater treatment gains for the two SDS groups.

(continued)

Table 3.1 (Continued)

Researchers	Type of intervention	Constructs investigated	Instruments used	Sources of self-efficacy information	Sample Population	Key findings
Fukuyama et al. (1988)	Interactive computer guidance program DISCOVER	CDMSE and career indecision	CDSES and CDS	Not stated	College students	Increased CDMSE for students who used DISCOVER before completing the instruments
Maples and Luzzo (2005)	DISCOVER in combination with career counselling	CDMSE	CDSES-SF (Betz et al., 1996)	Performance accomplishments	College students	Increased CDMSE for students in the DISCOVER only group without counselling
Sullivan and Mahalik (2000)	Group intervention for women (six 90-minute sessions over six weeks)	CDMSE	CDSES (Taylor & Betz, 1983)	Verbal persuasion, emotional arousal, vicarious learning and performance accomplishments	College students	Increased CDMSE for the treatment group, and gains were maintained six weeks later
O'Brien et al. (2000)	Career exploration class (50-minute sessions, five times a week for five weeks	CDMSE	Short version of the CDSES (Taylor & Betz, 1983)	Verbal persuasion, emotional arousal, vicarious learning and performance accomplishments	High school students at risk for academic and vocational underachievement	Increased CDMSE for the treatment group without a corresponding increase in number of occupations considered
McWhirter et al. (2000)	Career education class (50-minute sessions, five times a week for nine weeks)	CDMSE	CDSES-SF (Betz & Taylor, 1994)	Verbal persuasion, vicarious learning and performance accomplishments	High school students	Increased CDMSE and vocational self-efficacy, and the effects were maintained nine weeks later
Grier-Reed and Skaar (2010)	Constructionist career course (once a week for two hours over seven weeks)	CDMSE and career indecision	CDSES-SF (Betz & Voyten, 1997); CDS (Osipow, 1987)	Verbal persuasion, emotional arousal, vicarious learning and performance accomplishments	College students	Increased CDMSE without corresponding decrease in career indecision
Creed et al. (2006)	No intervention	CDMSE and career indecision	CDSES-SF (Betz et al, 1996); CDS (Osipow, 1987)	None	High school students	Changes in CDMSE did not result in changes in career indecision

3.3 Critical components of career interventions

In addition to career theories, specific techniques that have been shown to bring about positive outcomes should also be incorporated into curricula. Brown and Ryan Krane (2000) proposed that the format of the intervention may be less important than what is done within the intervention itself. They suggested that there may be some critical treatment ingredients that are important to client outcome and that the presence of these ingredients will improve the effectiveness of an intervention across all formats or types. In a meta-analysis of research studies on career interventions to identify the components that are most influential on participant outcomes, of the 19 components commonly found in interventions, five were found to be most influential in creating positive outcomes for participants. This is regardless of how the study was conducted, who participated in the intervention, and whether it was conducted in individual, group, class, or self-directed formats (Brown & Ryan Krane, 2000).

They found that these five critical ingredients not only seemed to be individually important to at least one career choice outcome, but also that combinations of them yielded larger effect sizes than did any one individually. Thus, they concluded that the effectiveness of career choice interventions can be increased if these five critical intervention components are built into them. These five components include (a) workbooks and written exercises (b) individualised interpretations and feedback (c) world of work information (d) modelling, and (e) attention to building support.

Since the publication of Brown and Ryan Krane's (2000) meta-analysis, a few studies on career interventions have begun to incorporate some of these components in their interventions and have reported positive outcomes. Fouad et al. (2009) and Scott and Ciani (2008) examined career courses that incorporate Brown and Ryan Krane's (2000) critical ingredients in addition to the four sources of self-efficacy information, and reported an increase in CDMSE and less difficulty in making career decisions. Reese and Miller (2006) evaluated a career development course that incorporated four of Brown and Ryan Krane's (2000) critical ingredients and reported significant increases in CDMSE among university students and a reduction in perceived career difficulties. In a follow-up study, Reese and Miller (2009) made modifications to their course and incorporated all five critical interventions components and found that the effect sizes increased to close to 1.00 compared to the earlier study of 0.55.

Although these studies provide some support that the effectiveness or effect sizes of career interventions can be increased through incorporating these five critical ingredients, only a few studies specify that the five components were intentionally included. Therefore, more research in this area is necessary. Furthermore, as Brown and Ryan Krane's (2000) meta-analysis provides little guidance on how each of these components can be implemented in practice and research, Brown et al. (2003) proposes a few suggestions on how their effects can be maximised. It would be interesting to investigate if these suggestions would further increase the effectiveness of career interventions. Ultimately, the goal of interventions is to help students and interventions that are effective

would be very much appreciated by both career practitioners and students alike.

The next section discusses the various types of career interventions, and specifically career courses.

3.4 Career courses

There are many forms of career interventions: individual counselling, group counselling, career classes, group test interpretation, workshops, computer-assisted career guidance systems, and counsellor-free interventions (Whiston, Sexton & Lassoff, 1998) among others. Of these forms of interventions, Spokane and Oliver (1983) reported that group or career classes (also called career courses) were more effective than individual counselling or other interventions. Later, Oliver and Spokane (1988) found that of 11 types of career interventions, career classes produced the largest effect size with regard to client gains compared to other types of interventions. In a study by Davis and Horne (1986), no significant difference was found between a career course, and small group counselling in career decidedness suggesting that a career course is as effective as small group counselling. Whiston et al. (1998) found that career classes were the third most effective career interventions among eight categories of interventions investigated.

Career courses in the USA began in the early 20th century as a ‘method for delivering comprehensive career services to college students’ (Fouad et al.,

2009, p. 339). Many colleges and universities in the USA offer career courses to students. In a survey with colleges and universities in the USA, Halasz and Kempton (2000) found that 70 per cent of the institutions that responded to the survey reported having some form of a career course for students.

There are many types of career courses – from short career planning workshops to lengthier career courses that span one whole term. They also vary in design, scope and function. There are credit-bearing (usually one to three credits) and non-credit bearing courses; some are voluntary while others are compulsory for specific majors; some are highly structured while others are open-ended in format; some are offered in a stand-alone format while others are fully integrated into ongoing career services; some focus on self-assessment and career planning while others also include knowledge about labour markets and employment; some are taught by career counselling staff while others are taught by regular faculty in academic programmes (Folsom & Reardon, 2003). Early career development courses covered three major areas: (1) career choice factors; (2) career information; and (3) job-seeking techniques (Devlin, 1974). 20 years later, Mead and Korschgen (1994) found that courses were geared toward career decision-making, job search preparation, and specific disciplines. According to Herr, Rayman and Garis (1993), many counsellors and educators use career courses as an expedient alternative to one-to-one counselling because career courses can accommodate large numbers of undecided college students who enrol in universities each year.

Generally, career courses appear to be an important form of career

development intervention as many studies designed to evaluate the effectiveness of career courses provide evidence of positive output and outcome treatment effects (Folsom & Reardon, 2003). According to Folsom and Reardon (2003), outputs refer to the skills, knowledge and attitudes acquired by participants as the result of an intervention, such as positive career planning thoughts, increased career decidedness, and greater career maturity. Outcomes refer to resultant effects occurring at some later point in time such as course satisfaction, deciding on a major, and timely graduation from college (Folsom & Reardon, 2003). For the purposes of the present study, only studies involving career courses that examine output treatment effects, specifically career indecision, career decision-making difficulties, and CDMSE, using the CDS, CDDQ and CDSES or CDSES-SF as measurement instruments, were included for review in this section as these are the variables that are pertinent to the present study.

3.4.1 Courses to reduce career indecision

To examine output treatment effects of their interventions, several studies employed the CDS as a pre- and post-test measure for career indecision and reported significant positive gains. Carver and Smart (1985) reported that students in a career and self-exploration course experienced reduced career indecision. Lent, Brown, & Larkin (1986) found that science and engineering students who completed a career course reported significantly less post-course career indecision than the quasi-control group. Davis and Horne (1986) compared the effects of small-group counselling and career course on career

decidedness. The results indicate no significant difference between group counselling and career course treatment, but the CDS results indicated significant pre-test and post-test increases in scores for both groups following the interventions. Lisansky (1990) evaluated the effects of a life-and career-planning course among undecided college freshmen and found that the experimental group showed an increased level of career decidedness. Similarly, Halasz and Kempton (2000) found that students who completed a career course expressed greater comfort with their career decision-making situations and more certainty about their career choices.

There are also studies conducted outside the USA that reported positive effects of career courses. The results of Peng and Herr's (1999) study indicate that career education courses are able to significantly affect career certainty and career indecision among junior college students in Taiwan. In a later study, Peng (2001) evaluated the effectiveness of two career courses among college freshmen in Taiwan and found that students taking both courses reported statistically significant increases in post-test scores measured by the CDS indicating more career decidedness.

Garis and Niles (1990) investigated students in career planning courses and in conditions where computer-assisted career guidance systems (SIGI PLUS and DISCOVER) are included at two universities: Penn State University and University of Virginia. Several conditions were examined: career planning course with either DISCOVER or SIGI PLUS; career planning course without DISCOVER or SIGI PLUS; SIGI PLUS or DISCOVER only. The results of

their study indicate that all three treatment conditions produced significantly higher gains on the measures of career development including the CDS compared to the control group. However, the inclusion of a computer-assisted guidance system within a career planning class did not produce significantly higher gains on these measures. The strongest treatment condition was the career planning course without DISCOVER on the CDS. The researchers conclude that their study demonstrated the effectiveness of career planning courses, and provided support for the use of SIGI and DISCOVER. However, they suggest that computer-assisted career guidance systems may be most effective when they are not used as stand-alone interventions.

While most studies report positive treatment effects of interventions in the form of career courses, there is one study that did not report a decrease in career indecision measured by the CDS. Kern (1995) examined the effect of a career planning and decision-making course on career indecision. The results indicate that students who participated in the course did not report greater decidedness but instead reported higher levels of indecision than the control at the end of the course. The researchers explained that this finding could be attributed to the fact that students with higher initial levels of indecision chose to enrol in the course in the first place.

3.4.2 Courses to enhance CDMSE and to reduce decision-making difficulties

Several studies examined courses to enhance CDMSE and reported significant gains on the CDSES. Scott and Ciani (2008) investigated a career exploration

course offered by a large Midwestern university's career centre. The intervention is a semester-long undergraduate course and is a one-credit-hour voluntary elective for undergraduate students interested in exploring their occupational interests and decision-making. The majority of participants were unsure of their college major. The researchers felt that this career course provided students with exposure to and participation in Bandura's four sources of self-efficacy as well as contains some critical components proposed by Brown and Ryan Krane (2000). The results indicate that participants reported significant increases in CDMSE post-intervention. They also found significant post-intervention differences between men and women. Gender differences will be discussed in the next section.

Fouad et al. (2009) examined a semester-long (50-minute a week for 16 weeks) career exploration course for university students. The researchers explored how a career course focusing on career exploration affected individuals' career decision-making difficulties, CDMSE and perception of education and occupational barriers. Effects of the intervention were measured using the CDDQ, CDSES-SF and Perception of Barriers Scale – Modified Version (Luzzo & McWhirter, 2001). Using a pre-test and post-test design, the researchers reported significant increases in CDMSE and significant decreases in career decision-making difficulties. However, students' overall perception of educational and occupational barriers did not significantly decrease. The researchers propose that significant decreases in career decision-making difficulties can be attributed to the inclusion of career assessments to clarify interests and tasks encouraging students to research various careers and majors.

They also propose that increases in CDMSE can be explained through incorporating Bandura's four sources of information to increase students' self-efficacy. The researchers also conclude that the findings of their study provided support that incorporating the critical ingredients proposed by Brown and Ryan Krane (2000) in a career intervention will result in higher treatment gains. Although the researchers reported positive treatment gains, this study did not use a control group, so it is difficult to determine if the changes in the two variables were solely the result of the intervention.

Reese and Miller (2006) investigated the effects of a university career development course entitled 'Discovery: Career and Life Planning' to increase CDMSE and to address perceived difficulties with making career decisions. The university career development course is based on the cognitive information processing model and incorporated the critical components of effective career interventions suggested by Brown and Ryan Krane (2000). Using the CDSES-SF as a measure for CDMSE and the CDDQ to measure career decision-making difficulties, the researchers reported significant gains in CDMSE and a reduction in career decision-making difficulties.

In summary, there are many types of career courses with varying designs and functions. In spite of the variability in these courses, most studies have shown that they are effective in reducing career indecision and difficulties, and enhancing CDMSE. Given the positive outputs of career courses in reducing career indecision and decision-making difficulties, and enhancing CDMSE, it makes sense to develop and evaluate a career course to help students make career decisions in Malaysia where career courses are non-existent.

A review of the studies also shows that there are very few output studies that investigated career courses that are based on Bandura's self-efficacy theory (1977) and provided opportunities to students with exposure to and participation in the four sources of self-efficacy proposed by Bandura (1986). In addition, there are very few studies that incorporated Brown and Ryan Krane's (2000) critical ingredients of career interventions to increase treatment effects. Given the increasing demand for career courses in universities (Fouad et al., 2006), more empirical research on the effectiveness of career courses is essential to inform course developers.

3.5 Gender, career indecision, decision-making difficulties and CDMSE

A clear understanding of the influence of gender in career development is critical to providing the appropriate career development interventions (Niles & Harris-Bowlsbey, 2012). Many studies have shown that despite equal access to education and careers, there are 'gender differences in perceived occupational efficacy, career choice, and preparatory development' (Bandura, 2006, p. 13). Several studies investigating the link between gender and career indecision have found some support that gender is not related to career indecision (Neice & Bradley, 1979; Lunneborg, 1975; Osipow, 1990; Taylor & Popma, 1990). On the other hand, findings from other studies such as Gianakos (1995) and Gati et al. (1995) suggest that gender affects career decisions in the alternatives considered and in eventual choices although these effects do not consistently appear in the level of decidedness among students (Krieshok, 1998). It may be possible that the effects of gender on career indecision are more apparent in

cultures where female students are not given the same opportunities to make career decisions as men (Mau, 2000). Furthermore, Gati et al. (1995) argue that should gender differences exist, they must be recognised by both researchers and career counsellors so that appropriate interventions can be tailored to students' needs.

In research on career decision-making difficulties, Gati et al. (1996) found no gender differences in their sample. However, when comparing British and Chinese international students studying in two British universities, Zhou and Santos (2007) reported that female students had significantly more difficulties compared to male students among British participants while there were no significant gender differences among Chinese participants. Zhou and Santos (2007) proposed that the reason for this could be that the female Chinese participants in their study were mostly postgraduate students who might not necessarily occupy traditional female roles in China. The mixed results from these studies regarding gender show that further research is essential to find out if female and male students perceive decision-making difficulties differently.

In research on CDMSE, studies have produced mixed results. Several studies found either minimal or no gender based differences in CDMSE among college and school students (Chung 2002, Creed. et al., 2006; Luzzo & Ward, 1995; Taylor & Popma, 1990; Taylor & Betz, 1983). In contrast, some studies reported significant relationships between CDMSE and gender. For example, Betz and Hackett (1981) reported that female students felt more efficacious towards traditionally female occupations while male students generally feel

more efficacious towards careers in science and technology. Mau (2000) investigated cultural differences in career decision-making self-efficacy and career decision-making styles between American and Taiwanese college students. His findings reveal that female Taiwanese students reported significantly lower career decision-making self-efficacy compared to male Taiwanese students while there were no significant differences between female and male American students in terms of reported levels of career decision-making self-efficacy, suggesting that there may be cultural influences. He suggests that the collectivist-orientated culture of Taiwanese people may inhibit the development of self-efficacy.

In studies investigating career interventions, Scott and Ciani (2008) found that female students reported greater intervention gains in CDMSE compared to male students. The researchers concluded that the intervention was more effective for female students who reported significant increases in all five subscales of the CDSES. While male students also reported increases in CDMSE, there was no change in the problem-solving subscale of the CDSES. Results from this study show that female and male students responded differently to the intervention. However, in examining two career courses for college students in Taiwan, Peng (2001) found that gender was not a main effect in determining treatment effects.

In summary, the overall inconclusive findings regarding gender and career indecision, decision-making difficulties and CDMSE suggest that more research is necessary to fully understand the relationship between these

variables, especially within interventions aimed at enhancing CDMSE. Women in Malaysia remain under-represented in scientific and technical fields of study, resulting in under-representation in many industries requiring scientific and technical knowledge and qualifications[14]. This could be a result of not being given similar opportunities to engage in the decision-making process compared to men. Weak decision-making self-efficacy would inhibit career exploratory behaviour and the development of decision-making skills, and may result in problems in career decision-making (Betz, 2000). Given the importance of developing interventions that are sensitive to the needs of both men and women, gender will be investigated in the present study.

3.6 Summary

A review of research literature concerning career interventions shows that interventions incorporating the four sources of information proposed by Bandura (1977, 1986) were successful in increasing CDMSE. In addition, studies have shown that interventions incorporating Brown and Ryan Krane's critical components are effective in increasing effect sizes of interventions.

The review of literature has also identified several gaps in knowledge that the present study hopes to fill. Principally, while many intervention studies have investigated their effects on modifying CDMSE, few studies have investigated career indecision and career decision-making difficulties as intervention effects. Therefore, antecedent or causal relationships between CDMSE and

[14] Key Indicator of the Labour Market Malaysia, 2001-2010, Department of Statistics, Malaysia

career indecision, and between CDMSE and career decision-making difficulties have not been explored. Additionally, the relationships among all three constructs have not been investigated within a single study.

Secondly, despite the increasing numbers of students entering post-secondary education, and the increasing demand for career interventions for college students, there are few intervention studies focusing on career courses that provide participants with exposure to and participation in the four sources of self-efficacy proposed by Bandura, and which incorporated Brown and Ryan Krane's five critical components.

Thirdly, findings regarding gender and its impact on career interventions have been inconclusive suggesting more research is necessary.

Finally, most studies on career decision-making (including those on career interventions) were conducted with Western populations, with very few with Asian populations, and none (to my knowledge) with Malaysian students. Additionally, the three instruments that are widely used to measure career indecision, career decision-making difficulties, and CDMSE, namely the CDS, CDDQ and CDSES/CDSES-SF, have not been used with a Malaysian sample.

Having identified gaps in the research literature concerning career decision-making, the next section outlines the research aims, the research questions and hypotheses of the present study.

3.7 Research aims

As the goal of interventions is to reduce career indecision and career decision-making difficulties, it is important to ascertain the impact of CDMSE on career indecision and career decision-making difficulties. However, research investigating these three constructs are mostly correlational in nature, and few intervention studies have investigated career indecision and career decision-making difficulties as intervention effects. Therefore, the present study aims to investigate the relationship between CDMSE and career indecision, and between CDMSE and career decision-making difficulties.

Secondly, although intervention research involving the use of career courses have reported positive outcomes in reducing career indecision and decision-making difficulties, and increasing CDMSE, there remains a need to examine how career interventions affect students' career-related beliefs. Specifically, it is important to investigate if participating in an intervention that incorporates the four sources of information proposed by Bandura (1986) through which self-efficacy is modified coupled with Brown and Ryan Krane's (2000) five critical ingredients of a career intervention is able to affect positive changes in students' career decision-making process. Therefore, the present study aims to develop a career intervention, which provides opportunities to participants to be exposed to the four sources of information proposed by Bandura through which self-efficacy is modified, and which incorporates Brown and Ryan Krane's (2000) five critical ingredients, and to examine the effects of this intervention on CDMSE, career indecision and decision-making difficulties.

Thirdly, the generally mixed results regarding gender suggest that more data are needed to understand the effect of gender on the three constructs investigated. Therefore, the impact of gender on career interventions will be examined as well.

Finally, as studies on career decision-making and career interventions were mostly conducted using Western populations, the present study involving Malaysian students will contribute to literature on career interventions in this part of the world. Furthermore, as the three aforementioned instruments have never been used with a Malaysian sample, the factor structure of these instruments will be examined. An examination of the factor structure of these instruments with a Malaysian population will further extend our knowledge about the reliability and validity of the instruments across different cultures.

With these research aims in mind, the present study examines the effects of a career course on college students' career decision-making. Specifically, the study explores how a career course that incorporates the four sources of information proposed by Bandura (1986) through which self-efficacy is modified in combination with Brown and Ryan Krane's (2000) five critical ingredients of a career intervention affects students' CDMSE, career indecision and decision-making difficulties. The relationship between CDMSE and career indecision, and between CDMSE and career decision-making difficulties will also be examined. Additionally, the factor structure of the three main instruments will be explored with a sample of Malaysian college students.

Accordingly, five research questions and eight hypotheses were developed and investigated.

3.8 Research questions and hypotheses

The present study addresses the following research questions. The hypotheses that have been formulated in response to these questions have also been included below:

3.8.1 Research question one (RQ1)

Do the three main instruments reliably measure the three constructs for Malaysian college students?

Three hypotheses corresponding with the three main instruments have been formulated in response to this research question.

H1a: It is hypothesised that the original five factor model of the CDSES-SF (Betz et al., 1996) will not provide a good fit to the data on Malaysian college students.

H1b: It is hypothesised that data from a Malaysian sample will support the four factor structure of the CDS (Osipow et al., 1987).

H1c: It is hypothesised that the CDDQr (Gati & Saka, 2001b) will reliably measure career decision-making difficulties among Malaysian college students.

3.8.2 Research question two (RQ2)

How does participation in this career course affect students' CDMSE, career indecision, and career decision-making difficulties?

Three hypotheses have been formulated in response to this research question.

H2a: It is hypothesised that students in the intervention group will exhibit a significant increase in CDMSE as measured by the CDSES-SF and its subscales, and the effects will be maintained four weeks later.

H2b: It is hypothesised that students' overall career indecision will be reduced significantly after completing the course and its effects will be maintained four weeks later.

H2c: Students in the intervention group will exhibit a significant reduction in career decision-making difficulties as measured by the CDDQr, and its main and subcategories, and the effects will be maintained four weeks later.

3.8.3 Research question three (RQ3)

What is the relationship between CDMSE and career indecision?

H3: Students' increased CDMSE post-intervention is able to predict a decrease in career indecision at the follow-up four weeks later.

3.8.4 Research question four (RQ4)

What is the relationship between CDMSE and career decision-making difficulties?

H4: Students' increased CDMSE post-intervention is also able to predict career decision-making difficulties at the follow-up four weeks later.

3.8.5 Research question five (RQ5)

Do male and female students respond differently to career interventions?

Although it is predicted that gender will have an impact on the three constructs examined, a specific hypothesis concerning the amount of change by gender on any dependent variable is not advanced.

3.9 Chapter summary and conclusions

The first part of this chapter detailed the review of literature on interventions including career courses and critical components. A discussion of the inconsistent findings in literature concerning gender was also presented. The latter part of the chapter presented the research aims, research questions and hypotheses for the study. The next chapter details the research design and methodology that have been chosen to investigate the research questions presented here.

CHAPTER 4 – RESEARCH DESIGN AND METHODOLOGY

4.1 Chapter overview

The previous chapter presented the research aims, research questions and hypotheses for this study. This chapter details the rationale for the research design and methodology chosen for this investigation, followed by the sampling strategy adopted, sample size requirements and a description of the participants. The chapter continues with a detailed description of the instruments used, the procedure adopted, and how ethical issues were addressed. It then concludes with a summary of the key points.

4.2 Rationale for the research design and methodology

The ability to make good career decisions has become increasingly important because of changing work practices worldwide as a result of rapid globalisation and technological advances. With increased choices of university courses, more opportunities to pursue higher education, and expanding work opportunities globally, the career decision-making process is more complex and challenging for students.

Many college students lack the experience and knowledge in making career decisions (Kelly & White, 1993, cited in Orndorff & Herr, 1996). If students remain undecided about a major or career, they are likely to make less than optimal career and academic choices which in turn will significantly impact

their future (Fouad et al., 2009). Therefore, schools and colleges try to help students by carrying out interventions to increase students' ability to make career decisions. However, many of these interventions are not based on the latest research and career theory (Halasz & Kempton, 2000; Reese & Miller 2006). Although research has shown that career interventions are generally effective, little is known about the elements that make them effective.

As the need for career interventions will only increase with increasing numbers of students pursuing higher education, there is an urgent need to ensure that career interventions are responsive to student needs and changing work requirements (Reese & Miller, 2006). Therefore, the present study aims to develop a theoretically-based and culturally-sensitive career intervention in the form of a career course and to investigate its effects on increasing CDMSE and reducing career indecision, and decision-making difficulties. Specifically, the study explores how a career course, based on Crites' Career Maturity Theory, and incorporates the four sources of information proposed by Bandura (1986), through which self-efficacy is modified, in combination with Brown and Ryan Krane's (2000) five critical ingredients of a career intervention, impacts students' career decision-making self-efficacy, career indecision and career decision-making difficulties.

Given the research aims of the present study, the experimental method appears ideal as it is claimed to be 'the only way of definitively answering causal questions' (Davis & Bremner, 2006, p. 86). The present study seeks to answer the questions of whether changes in these three constructs are caused by the

intervention, and what magnitude of changes can be affected. In an experimental design, participants are assessed before and after the intervention so that any change measured may be attributed to the intervention. There would also be a control or comparison group used in order to determine whether or not any change discerned has occurred as a result of the intervention. Figure 4.1 sets out the experimental research design.

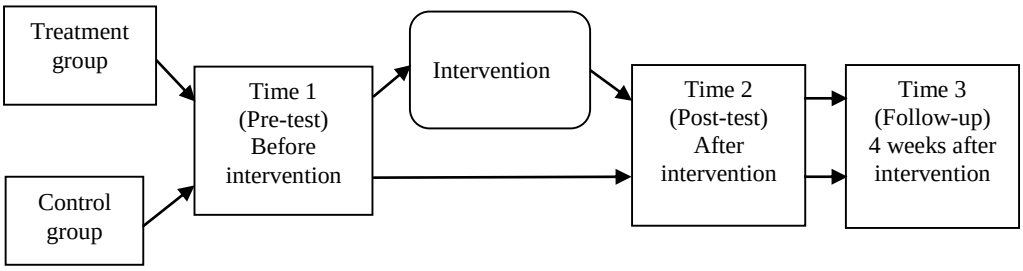


Figure 4.1. Experimental research design

As indicated in the diagram, participants in the intervention group are assessed immediately before the intervention. They are then reassessed at the end of the intervention. A follow-up assessment four weeks post intervention addresses the question of whether the effects of the intervention are fleeting or more permanent in nature. The control group indicated in Figure 4.1 should comprise an equivalent group of students who did not participate in the intervention. In an experimental research design, participants are also randomly assigned to either the treatment group or control group.

Although this research design is ideal, it is practically impossible in a college setting where students have a packed academic schedule. Students would generally participate in an intervention if they feel that they would benefit from

it and provided it fits into their schedule. It is also very difficult to motivate students to volunteer for a research project unless it is part of their formal academic curriculum which will contribute to their course credits. As a result of these constraints, a purely experimental design is not practical.

Given the constraints of the situation, a decision was made to adopt a quasi-experimental 'non-equivalent groups interrupted time-series design' (Morling, 2012, p. 350) based on the variants of the design elements outlined in Figure 4.1. The use of this research design looked to minimise any threats to internal validity of the research (i.e., is any change due to the intervention) whilst maximising the ability to establish statistical validity (i.e., is there a difference between participating in the intervention or not) (Morling, 2012). This is a quasi-experiment because participants were not randomly assigned to the two groups. Participants in the intervention group chose to participate in the intervention while the comparison group was made up of students who did not participate in or did not complete the intervention because of clashes in timetable but completed the measures four weeks before the intervention and four weeks after the intervention.

This research design also incorporates repeated measures in which participants in the intervention group experienced both conditions (with and without intervention). The intervention group was measured at four intervals: four weeks before the intervention, immediately before the intervention, immediately after the intervention, and four weeks after the intervention. See

Figure 4.2 for the quasi-experimental non-equivalent comparison group research design.

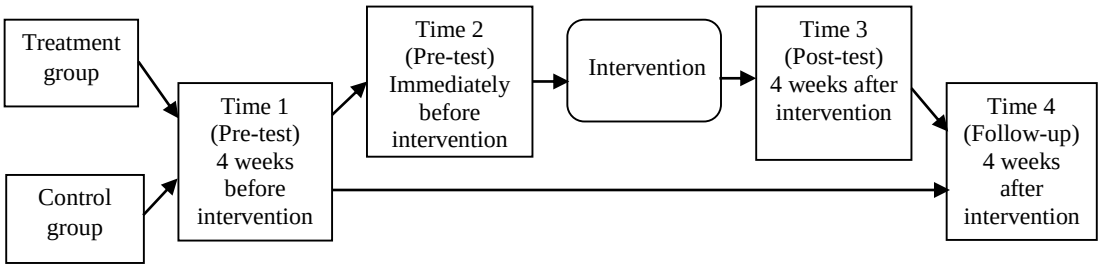


Figure 4.2. Quasi-experimental non-equivalent comparison group research design

The longitudinal approach involves data being collected from participants over four points in time (Time 1, Time 2, Time 3 and Time 4) for the intervention group, and on two points (Time 1 and Time 4) for the comparison group. See Table 4.1 for measurement points.

This design enables participants in the intervention group to be tested under both conditions (without and with intervention) and each participant acts as his or her control. This design also allows the researcher to establish changes in participants over time as the sample undergoes intervention (Fife-Schaw, 2006). As this design also includes a comparison group, any change taking place may be attributed to the intervention itself by comparing the data elicited from both groups.

Table 4.1

Measurement points for the intervention group

Time 1 - Four weeks prior to the start of the intervention
Time 2 - At the start of the four-week intervention
Time 3 - Immediately after the intervention
Time 4 - Four weeks after the intervention has completed

The intervention is a four-week long career course. A detailed description of the intervention can be found in the next chapter.

This study was primarily guided by postpositivist claims concerning knowledge, in that knowledge is developed through careful observation and measurement of objective reality which assumes that the data collected shape knowledge (Creswell, 2003) and that the phenomenon studied is measurable and quantifiable (Coolican, 2004). A strong emphasis within the postpositivist tradition of research is on developing numeric measures of the phenomenon investigated and to test and verify theories.

The three constructs in the study namely, career decision-making self-efficacy, career indecision, and career decision-making difficulties have been measured and quantified using previously published scales namely the Career Decision Scale (CDS by Osipow et al., 1976), Career Decision Difficulties Questionnaire (CDDQr by Gati & Saka, 2001b), and Career Decision Self-Efficacy Scale – Short Form (CDSES-SF by Betz et al., 1996), respectively, which have been tested and validated by numerous studies. Further details on

these instruments will be discussed below. These three instruments were combined into one questionnaire booklet called Making Career Decisions (MCD). The MCD was used as pre- and post-test measures.

The data collected are intrapersonal in origin and are elicited directly through self-report (or self-completion) questionnaires. In order to measure the effects of a career course in increasing career decision-making self-efficacy and reducing career indecision, and career decision-making difficulties among students, and to examine the relationships among these constructs, a quantitative treatment of data through statistical analysis was carried out. This type of analysis is most suited to the purpose of the study.

Krieshok's (1998) review of 50 years of empirical literature on career decision-making (i.e., 1948-1998), highlights several things that the field knows for sure about career decision-making, two of which have important implications for the present study. Firstly, he asserts that research has consistently shown that the psychological constructs investigated, such as career indecision, and its correlates, such as CDMSE, can be measured using the instruments developed to measure them with predictable outcomes (Krieshok, 1998). Secondly, individuals vary in degree in terms of these constructs and they are distributed normally across various samples of the population (Krieshok, 1998). A closer examination of the literature where these constructs have been investigated (i.e., Taylor & Betz, 1983; Taylor & Popma, 1990; Harren, 1979; Osipow & Gati, 1998; Mau, 2000) confirms Krieshok's (1998) assertions. Therefore, the present study is based on the assumption that the constructs investigated can be

assessed using the right instruments (those with acceptable psychometric properties as used in previous research) and that parametric analyses can be conducted on the data collected.

In summary, the present study adopts a quantitative treatment of data acquired from a quasi-experiment conducted longitudinally in a non-equivalent groups time-series design. This study is also driven by pragmatism that emphasises truth as 'what works at the time' and 'knowledge claim arises out of actions, situations and consequences' (Creswell, 2003, p.11). Within this research paradigm, the research problem is central to the investigation and researchers select methods, techniques and procedures from both quantitative and qualitative approaches that best meet their needs (Creswell, 2003). Therefore, recognising that qualitative research, using strategies of inquiry such as interviews and open-ended questions, is able to produce richer and fuller accounts of the phenomenon investigated (Coolican, 2004), qualitative methods were also incorporated into the design of the present study so that the data collected would provide the best understanding of the research problem (Creswell, 2003). In addition, the use of multiple methods permits triangulation as well as increases interpretability (Robson, 2002). Therefore, a secondary approach to data collection includes responses on a feedback form and email interviews with selected participants. Further details on the instruments used can be found below.

4.3 Participants

Students on pre-university courses were selected as participants in the study. Although students make career or educational decisions at various points in their lives, it becomes imperative at pre-university because at some point during their pre-university studies, they need to make applications to study at university, which requires them to state the course they want to study or choose a specific direction (e.g., business or science). There are various types of pre-university programmes in Malaysia that prepare students for university when they finish secondary school at age 17.

Form Six which leads to the *Sijil Tinggi Pelajaran Malaysia* (STPM) (or High School Certificate of Education) and the Unified Examination Certificate Senior Middle Three (UEC) are carried out in public and private secondary schools. Other programmes such as the GCE Advanced Levels (or A Levels), International Baccalaureate, Canadian matriculation, Australian matriculation, and American degree programme are carried out in private colleges and universities. The government also offers the local matriculation diploma programme which is offered exclusively in matriculation colleges for Bumiputera[15] students. The STPM and local matriculation diploma are accepted for entry into public universities only (except for one public university in Pulau Pinang) while most pre-university qualifications are generally accepted by most universities abroad and private universities locally for entry into undergraduate programmes, provided they meet the entry

[15] Official Website of the Ministry of Education Malaysia (http://www.moe.gov.my/en/program-matrikulasi) Accessed 7 May 2014

requirements. There are also various foundation programmes offered by private colleges and universities that prepare students to continue their studies in the same institutions.

4.3.1 Sampling strategy

For the sample of the study to be representative of all pre-university students in Malaysia, random sampling of students on all types of pre-university courses in a representative sample of all schools and colleges offering pre-university courses would be ideal. However, this was not possible due to time and resource constraints. Moreover, it was not possible to carry out the intervention in public schools and local government matriculation colleges because permission needed to be obtained directly from the Ministry of Education which may not be granted and would take too long. Besides, schools that offer STPM and local matriculation colleges are located all over the country. Therefore, opportunity sampling was carried out instead which resulted in the sample being more representative of pre-university students in private colleges. The impact of this decision will be discussed in the chapter on general discussion, implications and further research.

Students on the A Levels programme in two private colleges (one in Kuala Lumpur and one in Selangor) were chosen for the present study for several reasons. Firstly, the A Levels programme is the most popular pre-university course in private colleges in Malaysia (based on the number of institutions that offer this course compared to other pre-university courses) because of its

worldwide recognition and acceptance as an entry qualification for private universities locally and most universities overseas. Students spend a year studying three to four subjects of their choosing (from a total of 55 subjects offered[16]) to achieve an Advanced Subsidiary (AS) Level, and then another year to achieve the advanced (A2) level. There are two different examination boards in Malaysia – the Cambridge International Examinations and Edexcel. While they may differ slightly on assessment methods, both base their assessments on final examinations.

Secondly, students come from all over Malaysia to study A Levels in Kuala Lumpur and Selangor. In the pilot study (this is described in detail in Chapter seven), students were from 12 out of 15 states in Malaysia. Therefore, it was felt that students from most states of Malaysia would be represented in the sample. Thirdly, many students on A Levels programmes have not decided on a course of study at university. This pre-university programme allows students to enter a variety of courses at university based on the subjects they take so students do not need to make a university course or career decision at the on-set of the course. Therefore, some students choose this programme because they have not made a decision on their course or career.

Finally, administrators from these two colleges provided the necessary support for the study to be carried out among their students. For example, they allowed me to promote the course to the students through posters in the college and email to individual students, and provided a suitable venue with the necessary

[16] Cambridge International Examinations (http://www.cie.org.uk/programmes-and-qualifications/cambridge-advanced/cambridge-international-as-and-a-levels/) Accessed 22 May 2014

classroom technology and equipment for the course to be carried out in their colleges.

4.3.2 Sample size requirements

To compute the required sample size for ANOVA analyses, G*Power 3.1 (Faul, Erdfelder, Lang & Buchner, 2007; Faul, Erdfelder, Buchner & Lang, 2009) was used. By setting the significance level α at .05, the desired statistical power at 0.8, and an estimated small to medium population effect size (e.g., partial $\eta^2 = 0.25$), the sample size computed was 26. For the purposes of the present study, statistical power is set at 0.8 (80% probability of achieving a significant result if an effect exists) following the suggestion by Tabachnick and Fidell (2014). With 101 cases for the intervention group and 121 cases for the comparison group, the sample size requirements for ANOVA analyses was met.

The required sample size for regression analyses depends on desired power, alpha level, number of predictors and expected effect sizes (Tabachnick & Fidell, 2014). The intervention is the IV so there is one predictor variable only in the study, and three dependent variables (DVs) (i.e., the three constructs namely CDMSE, career indecision and decision-making difficulties). Small to medium effect sizes are expected and alpha level is set at .05. Various guidelines have been proposed for determining sample sizes. According to Green's (1991) rules of thumb, the total sample size *N* should be equal or more than $50 + 8k$ (where *k* is the number of IVs) for testing multiple regression and

N should be equal or more than 104 + *k* for testing individual predictors. These rules of thumb assume a medium-size relationship between the IVs and DVs. Following these rules of thumb, the sample size for the present study should be at least 58 cases for regression analyses and 105 cases for testing individual predictors. Therefore a total sample size *N* of 244 (with 101 for the intervention group and 121 for the comparison group) for the present sample meets this requirement for regression analyses.

In order to investigate the factor structure of the three main instruments for data collection, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) via structural equation modelling (SEM) will also be performed. The sample size required for these statistical analyses is different from regression analyses. For factor analysis, MacCallum, Widaman, Zhang and Hong (1999) proposed that samples between 100 and 200 are acceptable for well-determined factors (i.e., with loadings more than .80) and communalities in the range of .5. Further, they propose that at least 300 cases are needed for studies with a small number of factors, with three or four indicators for each factor, and with those with low communalities. Sample sizes over 500 are required for extremely low communalities and weakly determined factors (MacCallum et al., 1999). For SEM using the Maximum Likelihood Estimation (MLE) method, Hu, Bentler and Kano (1992) found that sample sizes over 500 performed well. MLE was chosen over other estimation techniques because it is more efficient and unbiased when the assumption of multivariate normality is met (Hair, Black, Babin & Anderson, 2010). Therefore, for the purposes of EFA and CFA, a sample size of more than 500

cases is desirable. Given that 692 participants completed the three instruments at Time 1, this sample size meets the requirements of EFA and CFA.

According to Ding, Velicer, and Harlow (1995), the minimum satisfactory sample size for conducting SEM models is between 100 and 150 subjects. Hair et al. (2010) propose that the minimum sample size depends on the model complexity and basic measurement model complexity. For example, for five or fewer latent constructs where each construct has more than three items, they propose a minimum sample of 100 to 150 cases. More complex models with higher number of constructs where each construct has fewer than three items would require bigger sample sizes. To investigate the relationship among CDMSE, career indecision, and decision-making difficulties, SEM was employed. A sample of 101 cases in the intervention group meets the minimum requirements of conducting SEM.

4.3.3 Description of participants

New students from two pre-university colleges were invited to participate in the study and 756 students completed the Making Career Decisions questionnaire booklet (MCD), consisting of the three instruments, four weeks before the intervention began at Time 1. Of the 756 students who completed the MCD, 48 were completed by international students (non-Malaysians), and 16 were incomplete or were not completed carefully, and were excluded from the data analyses. At Time 1, 692 students completed the MCD; at Time 2, 214 students completed the MCD; at Time 3, 123 students completed the MCD;

and at Time 4, 222 students completed the MCD. Of the 214 students who completed the MCD at Time 2, 91 students did not complete the intervention. Therefore, students who completed the MCD at four time points were considered the intervention group, while students who completed the MCD at Time 1 and Time 4 were considered the comparison group. Students who completed the MCD at Time 1 and Time 2 only were excluded from the analyses. Please see Table 4.2 for the number of students who completed the MCD at various time points.

Table 4.2

Students who completed the MCD at various time points

Group	Time 1	Time 2	Time 3	Time 4
Intervention	123	123	123	101
Comparison	121	30	0	121
Other	448	61	0	0
Total	692	214	123	222

After data cleaning, data from 244 students were included in the analyses (n = 244).

The intervention group consisted of 123 participants who completed the intervention while 121 participants who completed the instruments at Time 1 and Time 4 but did not undergo or did not complete the intervention were used as the comparison group. Female students consisted of 62.3% (152) of the sample and 37.7% (92) were male. Participants were aged between 16 and 19 years old. 86.9% are aged 18 and the mean age is 17.95.

Participants were studying the A Levels at two pre-university colleges namely Methodist College Kuala Lumpur (83.6%) and Taylor's College Subang Jaya (16.4%), and were new students in their first semester of study.

Participants were from 12 different states of Malaysia; with the majority from Selangor (43.9%) and Kuala Lumpur (37.7%) where the two colleges are located. Students from all over Malaysia go to these colleges for post-secondary education as 12 of 15 states or territories were represented in the sample.

81.1% of the participants were ethnic Chinese; 12.3% Indian; 2.9% Malay and 3.7% other. The ethnic composition of the sample is representative of private colleges in Malaysia where the majority are non-Malays. Malays receive government aid and are able to study in local matriculation colleges and public universities after they complete secondary school. Table 4.3 shows the demographic characteristics of participants.

Table 4.3

Demographic characteristics of participants

		Frequency	Percentage
Gender			
	Female	152	62.3
	Male	92	37.7
Age			
	16	6	2.5
	17	13	5.3
	18	212	86.9
	19	13	5.3
Course			
	A Level	244	100
College			
	Methodist College Kuala Lumpur	204	83.6

(continued)

Table 4.3 (continued)

	Frequency	Percentage
College		
Taylor's College Subang Jaya	40	16.4
State where students are from[17]		
Selangor	107	43.9
Kuala Lumpur	92	37.7
Sarawak	10	4.1
Perak	9	3.7
Johor	7	2.9
Negeri Sembilan	4	1.6
Pahang	4	1.6
Kedah	3	1.2
Melaka	3	1.2
Sabah	3	1.2
Terengganu	1	0.4
Pulau Pinang	1	0.4
Ethnic composition		
Chinese	198	81.1
Indian	30	12.3
Malay	7	2.9
Other[18]	9	3.7

In summary, a detailed description of participants, sampling strategy adopted and sample size requirements have been presented in this section. The next section details the instruments used.

4.4 Main instruments

The main instruments used in the present study include the Career Decision Scale (CDS by Osipow et al., 1976) as an overall measure of career indecision, the Career Decision Difficulties Questionnaire (CDDQr by Gati & Saka, 2001b) to measure the specific difficulties faced by students, and the Career

[17] All states are represented here except Kelantan, Perlis and Federal Territory of Labuan which are among the least-populated states in Malaysia (Population and Housing Census 2010, Department of Statistics Malaysia). Retrieved from http://www.statistics.gov.my/portal/index.php?option=com_content&view=article&id=1215%3Apopulation-distribution-and-basic-demographic-characteristic-report-population-and-housing-census-malaysia-2010 (27 May 2014)

[18] "Eurasians, Thais, Europeans, and other persons who do not fit into the three major categories" (Hirschman, 1987, p. 555)

Decision Self-Efficacy Scale – Short Form (CDSES-SF by Betz et al., 1996) to measure participants' confidence in carrying out decision-making tasks. These are described in detail below.

4.4.1 Career Decision Scale (CDS by Osipow et al., 1976)

The Career Decision Scale was designed as an 'instrument for surveying high school and college students about their status in the decision-making process' (Osipow 1987b, p. 1). This scale is widely known and used to measure the extent and nature of career indecision (Sepich, 1987; Betz & Voyten, 1997; Osipow, 1999). According to the manual (Osipow 1987b), the original version of the CDS (Osipow et al., 1976), consists of 16 items which reflect the causes of career indecision compiled from surveys of records of students seeking career counselling. These items have remained unchanged, while a further two items have been added to form the Certainty Scale (CS). The other 16 items now form the Indecision Scale (IS). The CS provides a measure of the degree of certainty that the student feels in having made a decision about a course of study and/or a career, while the IS is a measure of indecision. An open-ended question was also added to allow students to list other causes or problems not represented in the scale items. Thus, the CDS has 18 items divided into two subscales and an open-ended question at the end.

Participants are asked to indicate how closely each item describes them using a four-point response continuum ranging from *Exactly like me* (4) to *Not at all like me* (1). A sample item from the CS include: *I have decided on a career*

and feel comfortable with it. I also know how to go about implementing my choice. Sample items in the IS include: *Several careers have equal appeal to me. I'm having a difficult time deciding among them* and *I can't make a career choice right now because I don't know what my abilities are*. Summing scores for the CS provides an index of career and educational certainty or decidedness, while summing scores for the IS provides an index of career indecision. The two subscales are inversely correlated in that for the CS (items 1 and 2), higher scores indicate certainty and lower indecision, while higher scores for the IS (items 3 to 18) indicate less certainty and greater indecision. Some researchers have reversed the direction of the scoring for the CS to produce a total score of both scales as an index of career indecision (e.g., Neice & Bradley, 1979; Fuqua et al., 1987). For the purposes of the present study, this instrument was used an overall measure of career indecision and as such, scores from the Indecision Scale, consisting of 16 items only, was used. Mean scores for the IS were calculated by summing the scores for these 16 items and dividing by 16. Higher mean scores indicate greater career indecision.

Several studies have reported internal consistency and test-retest reliabilities of the CDS. Studies have reported high α coefficient scores for IS ranging from .89 to .90 (Betz & Voyten, 1997; Guay et al., 2003; Mau, 1995). Osipow et al. (1976) reported test-retest reliability of the IS to be .90 and .82 for two samples of college students over a two-week period. Slaney, Palko-Nonemaker and Alexander (1981) reported test-retest reliabilities over a six-week period for the two subscales with correlations ranging from .19 to .70 with total CDS scores yielding a correlation of .70. Although there is a wide range of scores for

reliability on these subscales, the reliability scores for the total scale are high, indicating good reliability. Therefore, it was felt that the scales demonstrated sufficient and acceptable reliability for use in this study. Clear support has also been reported for the construct and concurrent validity of the scale (e.g., Slaney, 1980; Osipow & Schweikert, 1981). A comprehensive review of the scales reliability and validity can be found in the CDS manual (Osipow, 1987b). In the present study, Cronbach's alpha for the IS ranged from .78 to .88 at four time points for the intervention group indicating a high level of internal consistency.

As there has been some controversy with regards to the factor structure of the CDS, and given that this instrument has never been tested with a Malaysian sample, the factor structure of the CDS will be explored in Chapter six.

4.4.2 Career Decision Difficulties Questionnaire (CDDQr by Gati & Saka, 2001b)

The CDDQ was originally developed by Gati et al. (1996) to test the validity of a taxonomy of decision-making difficulties. The taxonomy identifies three categories of sources of career decision-making difficulties (namely, lack of readiness, lack of information and inconsistent information) that are divided into 10 subcategories and further divided into specific difficulty areas. The questionnaire was devised to measure these categories with 44 items corresponding to 44 difficulties identified in the theoretical model. The *lack of readiness* category consists of three subcategories, namely, *lack of motivation*,

general indecisiveness, and *dysfunctional beliefs*. The *lack of information* category consists of four subcategories, namely, lack of knowledge of the stages of the career decision-making *process*, lack of knowledge about the *self*, lack of knowledge about *occupations*, and lack of knowledge about the ways of obtaining *additional information*. The *inconsistent information* category consists of three subcategories, namely, *unreliable information*, *internal conflicts*, and *external conflicts*.

An abridged version of the questionnaire containing 34 items (CDDQr) was developed more recently by Gati and Saka (2001b), and this version of the questionnaire was used in the present study because of the shorter time needed to complete it and it is comparable to the original version in terms of internal reliability.

A sample item from the *lack of motivation* subcategory include: *I know that I have to choose a career, but I don't have the motivation to make the decision now.* Sample items from the *general indecisiveness* and *dysfunctional beliefs* subcategories include: *It is usually difficult for me to make decisions* and *I believe there is only one career that suits me.*

A sample item from each of the four subcategories within the lack of information category include: *I find it difficult to make a career decision because I do not know what steps I have to take, I find it difficult to make a career decision because I do not know what my abilities and/or personality traits will be like in the future, I find it difficult to make a career decision*

because I do not know what careers will looks like in the future, and *I find it difficult to make a career decision because I do not know how to obtain additional information about myself (for example, about my abilities or my personality traits).* A sample item from the unreliable information subcategory include: *I find it difficult to make a career decision because I have contradictory data about the existence or the characteristics of a particular occupation or training program*. Sample items from the internal and external conflicts subcategories include: *I find it difficult to make a career decision because I do not like any of the occupations or training programs to which I can be admitted,* and *I find it difficult to make a career decision because people who are important to me (such as parents and friends) do not agree with the career options I am considering and/or the career characteristics I desire*.

Participants were asked to indicate how accurately an item describes them on a nine-point response continuum ranging from *Does not describe me* (1) to *Describes me well* (9). Mean scores for categories are obtained by adding up the responses to all items in their subcategories and dividing it with the number of subcategories, while a total mean score is obtained by adding up the mean scores of all ten subcategories. Higher mean scores indicate greater difficulties in making career decisions.

Several studies reported a sound psychometric base for the original instrument (Gati et al., 1996; Osipow & Gati, 1998; Mau, 2001). Gati et al. (1996) reported internal consistencies with α coefficients ranging from .40 to .95 with a sample of 304 university students, and a test-retest reliability of .67 (lack of

readiness), .74 (lack of information), .72 (inconsistent information) and .80 for the total score. Mau (2001) reported internal consistencies with α coefficients ranging from .33 to .94, and test-retest reliability of .56 (lack of readiness), .85 (lack of information), .78 (inconsistent information) and .85 for the total score for his sample of 93 Taiwanese students. However, he found that the taxonomy fits less well with Taiwanese students suggesting that the structure of decision-making difficulties may vary as a function of cultural differences. For instance, in his study, using path analyses, he found that a *lack of information* had a greater impact on career indecision for Taiwanese students, whereas a *lack of readiness* had a greater impact on career indecision for American students. His findings suggest that culture may be a significant factor in career decision-making (Mau, 2001). Given that this taxonomy has not been investigated among a Malaysian population, it will be explored later in the study.

For the newer abridged version, Amir and Gati (2006) reported a median scale reliability of .72 and that of the total score was .90 for this version. In the present study, reliability analyses indicated the internal consistency on the total scale ranged from .90 to .94 at four time points for the intervention group. Coefficient alpha for the subcategories were .55 (readiness), .92 (lack of information), and .79 (inconsistent information) at Time 1.

Participants were asked to state whether they had considered the field in which they would like to major in or an occupation they would like to choose, and to rate the extent of their confidence in their choice at the beginning of the questionnaire. Finally at the end of the questionnaire, participants were asked to rate the overall degree of difficulty in making a career decision.

4.4.3 Career Decision Self-Efficacy Scale – Short Form (CDSES-SF by Betz et al., 1996)

The Career Decision Self-Efficacy Scale (CDSES) developed by Taylor and Betz (1983) was designed to measure self-efficacy expectations in carrying out tasks necessary for making career decisions. The scale was based on the five career choice competencies postulated in Crites's (1978) model of career maturity and assessed by Crites's Career Maturity Inventory. The five competencies corresponding to the five subscales of the CDSES are as follows: *self-appraisal, gathering occupational information, goal selection, planning*, and *problem-solving*. There are 50 items in the scale with 10 items reflecting each competency. This scale was subsequently revised and shortened by Betz, Klein and Taylor in 1996. The Career Decision Self-Efficacy Scale – Short Form (CDSES-SF) was developed by eliminating five of the ten items from each of the subscales. Thus, the CDSES-SF consists of five 5-item subscales with a total of 25 items. The CDSES-SF was used in the present study.

A sample item from each of the five subscales include: *Accurately assess your abilities; Use the Internet to find information about jobs or occupations that interest you; Make a career decision and then not worry whether it was right or wrong; Determine the steps you need to take to successfully complete your chosen course/major;* and *Identify some reasonable course/major or career alternatives if you are unable to get your first choice.*

Originally, a ten-level response continuum was used. However, Betz, Hammond and Multon (2005) reported that the five-level response continuum provides scores as reliable and valid as those obtained with a ten-level response continuum. Therefore, in the present study, the five-point response continuum is used.

Participants were asked to rate their level of confidence in completing the given tasks, on a five-point confidence continuum ranging from *no confidence at all* (1) to *complete confidence* (5). The mean score for each subscale is calculated by adding up the responses to the five items within each subscale, and dividing it by five, while the total mean score is calculated by adding up the mean scores of all five subscales and dividing it by five. Higher mean scores indicate greater levels of self-efficacy in career decision-making.

The CDSES-SF has been shown to be psychometrically sound with internal consistency reliabilities ranging from .73 to .83 for the five-item subscales and .94 for the total score (Betz et al., 1996). Other studies reported internal consistencies ranging from .69 to .97 (Chung, 2002; Betz & Voyten, 1997; Guay et al., 2003). The coefficient alpha of the total scale for the present sample ranged from .88 to .93 at four time points for the intervention group indicating a high level of internal consistency. Coefficient alpha for the subscales were .71 (self-appraisal), .60 (occupational information), .83 (goal selection), .70 (planning), and .66 (problem-solving) at Time 1.

In terms of criterion-related and construct validity, Betz and Luzzo (1996) reported that research has consistently shown that stronger perceptions of career decision-making self-efficacy are related to lower levels of career indecision as measured by the CDS. Correlations between the CDSES-SF and CDS ranged from -.19 to -.66 for the indecision subscale and from -.03 to -.76 for the certainty subscale (Betz et al., 1996).

There have been some conflicting findings with regards to the factor structure of the CDSES. In the original study by Taylor and Betz (1983), five factors based on the five subscales were extracted and these accounted for 52 per cent of the total variance. In Taylor and Popma's (1990) study, only 26 per cent of the variance was accounted for by the factor structure. On the other hand, Peterson and delMas (1998) found that the CDSES comprises two major factors, and Gati, Osipow and Fassa (1994) reported that when certain items were removed, the five-factor structure did emerge. In their manual for the CDSES (revised 2006), Betz and Taylor (2006) suggest that the five-subscale structure of the CDSES should be retained despite conflicting factor structure findings. This is because the five subscales were derived from a well-respected theory (Crites's Career Maturity Theory, 1978) and that the subscales have important implications for the design of career interventions. Given the conflicting findings about factor structure of the instrument, and as the CDSES-SF has never been used with a Malaysian sample, the factor structure of the CDSES-SF will be investigated in this study. A detailed description of the investigation can be found in Chapter six (section 6.2).

4.4.4 Revisions to items on two instruments

The wording of several items on the CDS and CDSES-SF was revised for clarity. This is because some of these terms are not commonly used in Malaysia. Table 4.3 lists the items that were revised.

Table 4.4

Revision to items on the CDS and CDSES-SF

Original items	**Revised**
Career Decision Scale (Osipow et al. 1976)	
I have decided on a major and feel comfortable with it. I also know how to go about implementing my choice.	I have decided on a *course/*major and feel comfortable with it. I also know how to go about implementing my choice.
I know what I'd like to major in, but I don't know what careers it can lead to that would satisfy me.	I know what I'd like to major in *or study*, but I don't know what careers it can lead to that would satisfy me.
I don't know what my interests are. A few things 'turn me on' but I'm not certain that they are related in any way to my career possibilities.	I don't know what my interests are. A few things *interest me* but I'm not certain that they are related in any way to my career *options*.
I think I know what to major in, but I feel I need some additional support for it as a choice for myself.	I think I know what to major in *or study*, but I feel I need some additional support for it as a choice for myself.
CDSES-SF (Betz, Klein & Taylor, 1996)	
Select one major from a list of potential majors you are considering.	Select one *course/*major from a list of potential majors you are considering.

(continued)

Table 4.4 (continued)

Determine the steps to take if you are having academic trouble with an aspect of your chosen major.	Determine the steps to take if you are having academic *problems* with an aspect of your chosen *course/*major.
Select one occupation from a list of potential occupations you are considering.	Select one *job or* occupation from a list of potential occupations you are considering.
Determine the steps you need to take to successfully complete your chosen major.	Determine the steps you need to take to successfully complete your chosen *course/*major.
Persistently work at your major or career goal even when you get frustrated.	Persistently work at your *course/*major or career goal even when you get frustrated.
Prepare a good résumé.	Prepare a good *CV or* résumé.
Decide what you value most in an occupation.	Decide what you value most in a *job or* occupation.
Find out about the average yearly earnings of people in an occupation.	Find out about the *monthly salary* of people in an occupation.
Change occupations if you are not satisfied with the one you enter.	Change *jobs or* occupations if you are not satisfied with the one you enter.
Talk with a person already employed in a field you are interested in.	Talk with a person already *working in a job or* field you are interested in.
Choose a major or career that will fit your interests.	Choose a *course/*major or career that will fit your interests.
Identify employers, firms and institutions relevant to your career possibilities.	Identify employers, firms and institutions relevant to your career *aspirations/ambitions*.

(continued)

Table 4.4 (continued)

Find information about graduate or professional schools.	Find information about *postgraduate or professional training courses and colleges/universities.*
Identify some reasonable major or career alternatives if you are unable to get your first choice.	Identify some reasonable *course/*major or career alternatives if you are unable to get your first choice.

A copy of the MCD can be found in Appendix A. Permission to use the CDSES-SF and CDDQr can be found in Appendix B.

4.4.5 Inclusion of validity items

To verify if students had responded to each item on the questionnaires carefully, a validity item phrased, 'please skip this item' was added to the CDSES-SF. Participants who did not provide a response to this item were likely to have read the item carefully whereas those who provided a response to this item were considered less careful and were thus excluded from the analyses. The CDDQr has two validity items (e.g. items 7[19] and 12[20]). If the score for item 7 is high (> 4), the score is expected to be low (< 5) for item 12 and vice-versa (Gati & Saka, 2001b). Participants who did not provide acceptable responses to these two items were excluded from the analyses.

[19] Item 7: *I like to do things my own way*
[20] Item 12: *I always do what I am told, even if it goes against my own will*

4.5 Feedback form and email interviews

Other methods used for data collection include a feedback form and email interviews.

At the end of the course, participants were given a form with questions including open-ended ones for them to provide feedback on the course. The email interviews also asked similar questions but in greater depth.

Specifically, participants were asked the following questions on the feedback form:

1) Have you made a career/course decision?
2) Which topics are most relevant to you?
3) Please rate the following areas: length of course, quality of materials, topics covered
4) Did the course you help you in making a career/ course decision?
5) If yes, how has the course helped you? If no, please explain why.
6) What are some of the lessons you learned in the course?
7) Which activity did you enjoy the most and why?
8) What other topics would you like covered in the course?
9) How can this course be improved?

In addition to some of the questions above, participants in the intervention group were asked the following questions in the email interview:

1) There are five key competencies in making career decisions: self-

appraisal, goal selection, gathering occupational information, planning and problem-solving. Did your confidence in any of these key competencies increase after the course? Please explain.

2) If you have not made a career or course decision, what is preventing you from making a decision?
3) If you have made a career or course decision, what were some of the career decision-making difficulties that you overcame?
4) If there is a follow-up course, what would you like this course to cover (in the area of career decision-making)?

4.6 Procedure

Permission was sought from two private colleges to conduct the research. Once permission was granted, these colleges also provided me with the dates and times for the briefing sessions with students as well as for the career decision-making course. Physical and soft copies of posters with course details were given to the colleges to be posted on notice boards and sent out as emails to students by the college administrators to promote the career course to students. Briefing sessions were conducted during the colleges' orientation week for new students. During these sessions, students were given a briefing about the career course and were invited to participate in the study. Consent forms were given out and students were asked to read the consent forms carefully and to sign and return them to me before the MCD was given to them. Students who did not complete and return the consent form did not receive the MCD.

Registration forms with details of the days, times and venues for the course were also circulated to students who would like to participate in the course (a detailed description of the course including its theoretical foundations is presented in the next chapter). The same topic was repeated four times in a week to accommodate the students' busy schedule. Hence, they could select the day they wished to attend in the week that they did not have class or extracurricular activities. Students had different schedules depending on the subjects they took and the extracurricular activities in which they were involved. For example, students who chose to attend the course on Monday at 4.00-6.00pm would come at the same time and day for four consecutive weeks. As participation in the course was purely voluntary, many students who initially signed up for the course during the briefing sessions did not eventually attend the course four weeks later despite reminders that were sent through email and text messages. There were also students who attended the course at the beginning, but did not complete the course eventually. The attrition rate of students is presented in Table 4.5 below.

Table 4.5

Attrition rate of students over the duration of the course

	Briefing session (Time 1)	Session 1 of the course (Time 2)	Session 2 of the course	Session 3 of the course	Session 4 of the course (Time 3)
Number of students	692	214	157	145	123

Initially, the plan was to test the instruments and the course in one semester (Sem 1) with students from two colleges in a pilot study (a detailed description

of the pilot study including statistical analyses of the data collected and its impact on the present study are presented in Chapter seven). After modifications, the course would then be carried out in the subsequent semester (Sem 2) with a new cohort of students. These two colleges had three intakes in a year. However, the number of participants who completed the course during Sem 2 fell below expectations (i.e., below 100 participants). Therefore a decision was made to repeat the entire data collection process which included carrying out the course a second time in the following semester (Sem 3).

In summary, data collection for the main study spanned two semesters with two different cohorts of students from two colleges. Although data from participants were collected over a period of two semesters spanning six months, these were combined and analysed together. It was felt that the decision to combine and analyse the data together would not have an impact on the results because the researcher facilitated all the briefing sessions and taught all the sessions for the course. A detailed analysis of the data from participants can be found in Chapter eight.

4.6.1 Data collection procedure for the main instruments

Students were invited to participate in the study during their orientation week at college and were asked to complete MCD that consisted of three instruments. This was the first time that students completed the instruments (Time 1). Students were then asked to complete the instruments four weeks later prior to the start of the course (Time 2). Data collected at Time 1 and

Time 2 provided the baseline for each individual before the intervention commenced. Upon completion of the course which was four weeks later, participants completed the instruments again (Time 3). Four weeks after that, students were asked to complete the instruments yet again (Time 4). At Time 1, Time 2 and Time 3, physical MCD booklets were distributed and collected immediately after students had completed them. However, at Time 4, students completed the instruments online (within a week) as it was not possible to gather all students in one location at one specific time. Students in the intervention group completed the instruments at all four time points while students in the comparison group completed the instruments at Time 1 and Time 4 only.

As some participants had to complete the same instruments more than twice, especially participants in the intervention group who would complete the same instruments three or four times throughout the experiment, this may give rise to order effects where an individual's performance is affected by the 'serial nature of testing' (Fife-Schaw, 2006). While familiarity with the instruments will not affect the performance of participants because the instruments concern participants' career decision-making behaviour, I was concerned that fatigue or boredom might influence the way participants respond to the instruments when exposed to them repeatedly. Therefore counterbalancing of the three instruments used was enforced to minimise order effects. See Table 4.6 below for counterbalancing of instruments within the MCD.

Table 4.6

Counterbalancing of instruments

Order of instruments given to participants

Time 1	A	B	C
Time 2	B	A	C
Time 3	C	B	A
Time 4	A	C	B

A = CDSES-SF; B = CDS; C = CDDQr

The same cycle was repeated in Sem 3 when it was discovered that the number of participants who completed the course fell below expectations.

4.6.2 Data collection procedure for feedback form and email interviews

At the end of the fourth session, feedback forms were given to participants to fill, and were collected immediately after they had completed them. Participants were not required to write their names on these forms so they were generally willing to give their feedback on the course.

Questions were emailed to all participants in the intervention group two weeks after they completed the course. Participants were given one week to respond with their answers. Participants who answered the questions provided responses to questions that were relevant to them suggesting that they understood the questions. They were also quite candid in their responses regarding their career decision-making process. However, because of the small number of students who responded, the data gathered did not provide a

complete picture of the constructs studied but were illustrative of some aspects of these constructs only.

4.7 Data analysis procedure

Data for this study were obtained via questionnaires, feedback forms and email interviews. Both descriptive and inferential statistical techniques were used to analyse the data. Descriptive statistical analyses, including frequencies, percentages, means (M) and standard deviations (SD) were used to summarise participants' responses. Inferential statistical analyses were used to identify relationships among the constructs investigated and to compare responses from female and male participants. The level of statistical significance has been set at a minimum of 0.05 ($p < 0.05$) for all relevant analyses beyond which results would be considered not significant. The IBM Statistical Package for Social Sciences (SPSS) version 20 and Analysis of Moment Structures (AMOS) version 22 were used to analyse quantitative data.

4.7.1 Data from questionnaires

As the purpose of this study was to examine the effects of a career course on college students' career decision-making, data collected from the three instruments at various time points were analysed to provide answers to research questions on the effects of the course on students' CDMSE, career indecision, and career decision-making difficulties; the relationships between CDMSE and career indecision, and CDMSE and career decision-making

difficulties; and gender differences. Total scores as well as scores from subscales of the CDSES-SF, and main and subcategories of the CDDQr were analysed. Although the CDS contains the two subscales, scores from the Indecision Scale (IS) were used only. This was because the CDS was used as an overall measure of indecision in this study. The CDDQr contained validity items which were not included in the analysis.

4.7.2 Data from feedback forms and email interviews

Responses to feedback forms and email interviews provided additional insights into the three constructs being investigated as well as the course that was carried out. Basically, data gathered from the feedback forms and email interviews were analysed and discussed based on the following themes:

1) Effectiveness of the course in helping students make career decisions
2) Confidence in carrying out tasks specific to making career decisions
3) Career decision-making difficulties

4.8 Ethical issues

An application for permission to begin data collection was submitted to the Research Ethics Committee of the University of Nottingham Malaysia Campus in November 2012. Approval to begin data collection was granted in January 2013. Data collection work commenced in February 2013. The approval letter obtained from the Research Ethics Committee of the University of Nottingham Malaysia Campus can be found in Appendix C.

The present study has sought to comply with the Code of Ethics and Conduct (revised August 2009) of the British Psychological Society and the Ethical Guidelines for Educational Research (2011) published by the British Educational Research Association. Special attention was given to the following five areas:

4.8.1 Voluntary nature of the study

Participants were informed at the outset of the study that their participation was absolutely voluntary and they had the right to withdraw at any stage during the study. Should they withdraw from the study, the data collected from them would not be used.

4.8.2 Privacy and confidentiality

Anonymity and confidentiality of participants were assured. The record of the study was kept confidential and in any reporting, participants would not be identifiable. Names of participants were not requested in the questionnaires (they were identifiable only through their email and in some cases their mobile numbers) and names of participants in the email interviews were not mentioned at all in this report.

4.8.3 Informed consent

Participants were briefed on the procedure and purposes of the study at the beginning and written consent forms (with details of the study outlined clearly – please see Appendix D for a copy of the consent form) were distributed to all participants. Questionnaires were distributed only to participants who had signed and returned the consent forms.

4.8.4 Deception and harm to participants

Participants in the study were not deceived in any way as the procedure and purposes of the study were clearly outlined. The present study also did not contain any elements that would have been harmful to participants emotionally or physically.

4.8.5 Debriefing of research participants

A short debriefing session was carried out for the first cohort (Sem 2) of participants in which they were allowed to ask questions. A debriefing session was not carried out for the second cohort of participants (Sem 3) because the college was unable to arrange for a suitable time where all participants could attend. Therefore, an email was sent to these participants to thank them for taking part in the study and to debrief them about the research objectives. All participants had my email so they could contact me if they had further questions about the study.

4.9 Chapter summary and conclusions

This chapter describes in detail the rationale for adopting a quasi-experimental longitudinal non-equivalent groups time-series design, in order to investigate the research questions for this study. This chapter also presented an in-depth description of the participants followed by the sampling strategy adopted, and sample size requirements. The instruments used, procedure adopted, and how ethical issues were addressed, were duly explained.

The next chapter proceeds to provide a detailed description of the intervention used, discusses the rationale for adopting certain methods and activities within the intervention, and highlights the ways in which four sources of information on which self-efficacy is modified proposed by Bandura (1986), and Brown and Ryan Krane's (2000) critical ingredients of career interventions are integrated into the intervention.

CHAPTER 5 – CAREER COURSE AS INTERVENTION

5.1 Chapter overview

A career course was designed and developed as an intervention for Malaysian college students who are undecided about a course to pursue at university or a career. Its theoretical foundations are clearly articulated and form the basis for the objectives of the course, and the topics, activities, techniques and materials that have been selected and used. As career development is a life-long process, having the skills to cope effectively with career development tasks such as career decision-making can help ensure both career and life satisfaction (Niles & Harris-Bowlsbey, 2013). This course aims to give students these skills. This chapter details its theoretical foundations; critical intervention components; objectives; length; and techniques, activities and materials used; and explains the rationale behind its development.

5.2 Theoretical foundations

Clear articulation of the theoretical foundations of the intervention is very important. According to Halasz and Kempton (2000), most of the institutions they surveyed did not use a theory or was not able to say what theory was implemented in their course, which means that their course content was most likely not based on empirically tested methods (Reese & Miller, 2006). Given that the demand for career interventions has increased with increasing numbers of students entering post-secondary education (Fouad et al., 2006),

interventions that have been validated through empirical methods have great utility for career practitioners today. Furthermore, it is important to know if established career theories on which this intervention is based are still relevant and are able to meet the needs of students in an ever-evolving world of work.

The career course was entitled "Effective Career Decision-Making: Skills for Making Successful Career Decisions". The course content was based on two major theories: Crites' (1978) Career Maturity Theory and Bandura's (1977, 1986) self-efficacy theory.

Crites' (1978) Career Maturity Theory was chosen as the basis of the career course because of several reasons. Firstly, the career decision-making self-efficacy (CDMSE) construct was developed and is measured using an instrument (i.e., the CDSES) that was developed based on the same theory. As defined earlier, CDMSE refers to an individual's belief or confidence that he or she is able to carry out tasks specific to making career decisions. These tasks are specified within Crites' (1978) Career Maturity Theory which are explained in detail below. Secondly, as the goal of the intervention is to increase CDMSE, it makes sense to structure the course content based on the same theory.

According to Crites' (1978) Career Maturity Theory, good career decisions are facilitated by five career choice competencies which include (a) accurate self-appraisal, (b) gathering occupational information, (c) goal selection, (d) making plans for the future, and (e) problem-solving. Therefore, effective

career decision-making, firstly, involves the ability to accurately assess one's skills and preferences, including personality, values and achievements, and other influences. Secondly, it involves being able to effectively use a variety of resources to gain insights into the world of work and to research occupations. This includes identifying education and training that will help students qualify for their future job or career. Students also need to understand the meaning of short- and long-term goals; know the steps to set realistic goals, and develop an action plan for achieving these goals. The ability to make good career decisions also hinges upon one's ability to solve problems so students are given the opportunity to learn problem-solving skills.

Self-efficacy theory (by Bandura, 1977, 1986) also forms the basis of this intervention. Similarly, self-efficacy theory was chosen because the CDMSE was a combination of Bandura's self-efficacy theory and Crites' Career Maturity Theory. According to Betz (2000), career interventions that are able to enhance career decision-making self-efficacy are those that are based on the four sources of information proposed by Bandura (1986) on which self-efficacy is based and through which self-efficacy is modified. These four sources of information include (a) 'performance attainments'; (b) 'vicarious experiences of observing the performance of others'; (c) 'verbal persuasion and social influences'; and (d) 'physiological and emotional states from which people judge their capabilities, strengths and vulnerability to dysfunction' (Bandura 1986, p. 399). Many studies have shown that interventions that incorporate one or more of these four sources of efficacy information have resulted in positive outcomes (e.g., Sullivan & Mahalik, 2000; Fouad et al., 2009). Therefore,

special attention was paid to these four sources of information through which self-efficacy is modified within the intervention. Specifically, students are able to experience the successful performance of a particular behaviour; they are given opportunities to identify with and learn from appropriate models; they are encouraged to believe in their own capabilities; and they will learn how to manage anxiety, and negative or self-defeating thoughts.

The ways in which this intervention facilitates the five career choice competencies and provides participants with exposure to and participation in the four sources of information proposed by Bandura on which self-efficacy is modified are described in detail in the section on course content and description below.

5.3 Critical intervention components

In addition to career theories, research shows that the effectiveness of career interventions can be increased by incorporating Brown and Ryan Krane's (2000) five critical intervention components. These components include (a) workbooks and written exercises (b) individualised interpretations and feedback (c) world of work information (d) modelling, and (e) attention to building support.

According to Brown et al. (2003), workbooks and written exercises can be defined as 'the use of workbooks, logs, and other written material that require participants to write their goals, future plans, and occupational analyses'

among other things. Individualised interpretations and feedback refer to the 'provision of opportunities to receive individualised feedback on test results, goals, and future plans' among others, regardless of intervention format. World of work information includes the 'provision of opportunities within the course to gather information on the world of work and on specific career options'. Modelling refers to 'exposure to models of career exploration, decision-making and career implementations' among others. Attention to building support refers to 'activities designed to help participants understand or build support for their career choices and plans' (Brown et al., 2003, p. 413).

Since the publication of the meta-analyses of critical components in career interventions by Brown and Ryan Krane in 2000, several studies have incorporated the use of these components within their interventions and have reported positive outcomes, most notably Reese and Miller (2006), Scott and Ciani (2008), and Fouad et al. (2009).

A detailed description of the ways in which these components have been integrated into the intervention is found in section 5.9.

5.4 Course objectives

Based on the theoretical foundations, and critical intervention components above, a list of objectives were developed to guide the selection of course content, materials and techniques used. These objectives reflect the learning outcomes that are expected of the participants at the end of the course, and

provide a basis by which success of the course can be measured. The first six objectives are based on the five career choice competencies within Crites' (1978) Career Maturity Theory, while the seventh objective is based on one of the four sources of information through which self-efficacy is modified (Bandura, 1986).

Course objectives included the following: (a) Identify and list top personal values, interests, skills and achievements, and articulate own personality, and work and lifestyle preferences (b) Identify relevant career resources that provide information on the world of work including jobs in demand and salary information (c) Explore and identify course and career options based on interests and abilities (d) List the steps for selecting goals, and to set personal and academic goals (e) Develop an action plan for the future that details steps to achieving the goals set earlier (f) Identify the problems in a case study and propose solutions, and (g) Identify obstacles and negative feelings that hinder the decision-making process, and list ways to overcome them.

5.5 Length of course

In deciding on a suitable length or duration for the career course, reference was made to studies that included career courses that have resulted in positive outcomes for CDMSE. Typically, these courses take place over half a semester or a full semester. For example, participants in the course by Grier-Reed and Skaar (2010) met once a week for two hours over seven weeks (a total of 14 hours), while participants in the course by Grier-Reed and Ganuza (2011) met

once a week for two hours over 15 weeks (a total of 30 hours). The course by Fouad et al. (2009) consisted of weekly 50-minute classes that spanned the 16-week semester (a total of 13 hours). The course by Scott and Ciani (2008) was a semester-long one-credit-hour elective (probably totalling 15 or 16 hours depending on how long the semester is). Participants in the course by Reese and Miller (2006) met for 50 minutes once a week for 15 weeks (a total of 12.5 hours). Overall, career courses at colleges and universities in the USA spanned between seven and 15 weeks totalling between 12.5 and 16 hours. However, given the packed schedule of college students on A Level programmes in Malaysia, it was not practical to conduct a course that spanned the whole semester (or 14 weeks). Therefore a decision was made to structure a course that met once a week for two hours and spanned four weeks with a total of eight hours only. It was felt that this duration was sufficient to meet the course objectives outlined above, and allowed time for participants to reflect on their own progress. Furthermore, as participation in the course was purely voluntary, it was expected that the attrition rate would be high if the course was any longer. Even for a four-week eight-hour long course, data from the pilot study showed that the attrition rate was high.

5.6 Techniques, activities and materials

Various techniques, activities and materials have been used in intervention studies that have shown positive outcomes in increasing CDMSE. In order to meet the course objectives outlined above, the following techniques and activities have been chosen: lectures, small group discussions, written

exercises, self-assessment instruments, and individual take-home assignments. It was also felt that these techniques and activities provided variety in the course. Take-home assignments included a personality test, informational interviews and a personal statement. Self-assessment instruments included Holland's Self-Directed Search and a free online personality test called the Jung Typology test that is based on the Myer-Briggs Type Indicator. Students completed a personal card-sort activity, a career genogram, and a case study on problem-solving. Students were also asked to consult individually with the instructor for feedback on self-assessment instruments.

Materials needed for the course include a course book for students containing written exercises and take-home activities, personal value cards, Holland's Self-Directed Search (SDS Form R Assessment Booklet and Occupations Finders – Revised 5th Edition), handout on role models, and a prezi presentation for each session. Examples and excerpts of the above materials can be found in Appendix E.

The reasons for selecting these techniques, activities and materials are explained in detail below.

5.7 Course content and description

Four main topics corresponding to the four sessions have been selected for the course. The rationale for each topic and the activities and materials selected is discussed in turn below. Each student was given a course book that functioned

as a workbook containing written exercises for them to complete. Sample pages of this course book can be found in Appendix E.

5.7.1 Session 1: My identity and motivation

The first topic on ‘My identity and motivation’ was included to help students develop the competency in assessing themselves in terms of their personal values, interests, skills, achievements, personality and family background influences, in line with Crites’ (1978) first career choice competency which is accurate self-appraisal. At the end of this session, it was expected that students would be able to gain a better understanding of their identity and motivation, and as a result be able to list their top personal values, interests, skills and achievements, and articulate their own personality, and work and lifestyle preferences. The activities and questions asked in their course book would enable them to more accurately assess these aspects of their lives.

In this session, a card sort activity was used for the section on identifying and clarifying personal values. Similar card sort activities were also carried by other researchers namely Sullivan and Mahalik (2000) and Fouad et al. (2009). A series of questions were posed to students to help them identify their academic and other interests. To identify skills, students were given a checklist of skills that relate to the following broad skill areas: data and information, creativity and design, communication, people, practical, technical and personal skills. Students were required to identify and tick the skills that they possess and provide an example for each. This activity was included because it exposed

them to the variety of skills sets that are commonly needed at the workplace and encouraged them to develop the skills that they did not already possess. In terms of achievements, students were asked to think about and reflect on their own lives, and list three major achievements in their lives. In exploring our values and beliefs, it is important to remember that we may be influenced by our family and backgrounds. This is especially prevalent in Asian families where parents often exert a big influence in their children's course or career decisions (Leung, Hou, Gati & Li, 2011). Therefore, the career genogram activity carried out by Sullivan and Mahalik (2000) and Grier-Reed and Ganuza (2010) was included in the course to help students identify familial influences on their own ideas about education, work or career, and if these ideas limit them in anyway.

A take-home activity was included after the first session because this activity took a longer time to do and could not be completed in class. The take-home activity was an online personality test called the Jung Typology Test which students can access for free at http:humanmetrics.com/cgi-win/JTypes.asp. The Jung Typology Test is based on the Myer-Briggs Type Indicator or MBTI (Tieger & Barron, 2007). This online personality test was chosen for several reasons: (1) it is free and easy to do; (2) students will be able to get their results in the form of a personality type and a description of the type instantly; (3) the website has information on famous people with the same personality type, and it also proposes courses that match the personality; and (4) the MBTI is a popular personality test and researchers such as Reese and Miller (2006),

Grier-Reed and Skaar (2010) and Grier-Reed and Ganuza (2011) have used it in their interventions to increase CDMSE.

5.7.2 Session 2: The world of work

Crites' (1978) second career choice competency is gathering occupational information. Therefore, the second session on 'the world of work' focuses on helping students find relevant work-related information. In this session, students completed the Self-Directed Search Assessment Booklet (Holland & Messer, 2013). This instrument comes with an assessment booklet and an occupations finder. This self-directed career assessment was chosen because it is easily understood and scored; it can be completed within an hour; and this instrument encourages students to evaluate their own competencies, and exposes students to many occupations that match their summary code. Furthermore, it was also used by other researchers who developed career interventions namely Sullivan and Mahalik (2000). In the area of gathering world of work information, Fouad et al. (2009) used the RIASEC cards exercise while Grier-Reed and Skaar (2010) and Grier-Reed and Ganuza (2011) used the Strong Interest Inventory which is based on the RIASEC theory of careers that was developed by John Holland (Holland, 1985) and on which the Self-Directed Search is based.

In addition to this career assessment instrument, students were asked to consider and identify the people, environment and lifestyle preferences, and work values of their future careers. A discussion of jobs in demand and jobs

that are disappearing as well as salary ranges for entry-level jobs, and the factors that determine graduate salaries, was also carried out. Students were also asked to identify resources for information on jobs.

For the take-home activity, students were asked to conduct informational interviews with two people who are in jobs that interest them and to summarise these interviews in the course book. The purpose for informational interviews is to provide students with the experience of gathering occupational information from sources beyond the Internet. A list of questions was provided in the course book to guide these interviews. As a follow-up activity, students were asked if they had gained any new information from these interviews and whether they would consider pursuing either one of these careers. Informational interviews were also included as part of their intervention by Scott and Ciani (2008), and Reese and Miller (2006).

5.7.3 Session 3: Targets and plans

The third session on 'targets and plans' was focussed on selecting goals and making plans for the future which are Crites' (1978) third and fourth competencies in making good career decisions. The third session begins with a career fantasy where students imagine what they would be doing 10 years from now. This activity was adapted from the Career Visualisation Exercise by Grier-Reed (2007, unpublished manuscript, personal communication). This activity was included because it encouraged students to consider the future and how to get to where they want to be. It was important for students to have a

vision of the future so that they could work towards making that vision a reality.

The second activity extends the earlier career fantasy by getting students to create a career timeline that details events or achievements that they hope will take place in their lives till retirement. Students are asked to mark out yearly dates of career and life events that they anticipate or hope to accomplish. This activity was adapted from the Idealistic and Realistic Career Timeline Exercise by Sullivan (2000, Manual for Women's Career Decision-Making Group, personal communication). This activity encourages students to list concrete plans for their lives and targets to achieve within a specific time. After that, students were given a short lecture on the meaning of short- and long-term goals, and strategies on how to make plans for the future. In their course books, students were required to complete an action plan that details the following: (1) jobs that they want to know more about; (2) skills and abilities needed for these jobs; (3) education/training/qualifications necessary to get into these jobs; (4) short-term goals; and (5) long-term goals.

At this point of the intervention, students would have gathered sufficient information about their interests and careers that match, and therefore would be able to complete this exercise. The session ended with a short discussion on the advantages of a university education; the considerations for choosing a university; and what makes a scholarship application stand out.

The take-home activity is to write a 700-word personal statement. In explaining this task to students, the definition and requirements of a personal statement were provided.

5.7.4 Session 4: Problem-solving and decision-making

The final session focused on Crites' fifth competency which is problem-solving. Students were put into groups to discuss a case study in which they had to identify the problem(s) and propose solutions. The problem-solving process is then discussed in relation to making course or career decisions. The next part of the session focused on discussing a list of decision-making ideas that are erroneous. This activity was adapted from the exercise on Self-Defeating Ideas about Career Decision-Making by Sullivan (2000, Manual for Women's Career Decision-Making Group, personal communication). Students got into pairs to discuss whether they agreed or disagreed with these ideas and to give their reasons for believing so. This activity was included because it provided the opportunity to debunk some myths about career decision-making (e.g, 'there is one and only one right job for you and true happiness is impossible until it is found'). It also gave students the opportunity to voice their concerns about making career decisions, and to listen to other students' opinions about making career decisions.

In the subsequent part of the session, students were given handouts on role models to read in order to answer a list of questions on their course book. The purpose of this activity was to get students to learn from other people's career

decision-making journeys. The final part of the session highlighted some potential problems students might face with significant others such as their parents, and proposed various ways in which to get support from them for their decision, for example through effective communication. The session ended with a short discussion on who and what a mentor is, and how to find one.

The take-home activity is to reflect on the sessions and activities that were completed over the last four weeks, and to write down any areas in their lives in which they need to make changes, and some immediate actions to take moving forward.

In summary, the content, activities, and materials used were very much focused on helping students develop Crites' (1978) five career choice competencies in making good career decisions. The next two sections detail the ways in which the four sources of information on which self-efficacy is modified proposed by Bandura (1986) and the five critical components identified by Brown and Ryan Krane (2000) were integrated into the course.

5.8 Integration of Bandura's four sources of information

The course provided sufficient opportunities for participants to be exposed to and participate in Bandura's four sources of information on which self-efficacy is modified. Each of the four sources of information is explained below.

In order for students to experience performance accomplishments, they were carefully guided through a series of activities throughout the course which they could complete on their own. For example, through completing the MCD questionnaire booklet at the start of the first session, they would be able to identify their specific career concern and to set a clear personal goal to achieve at the end course. In addition, the take-home online personality test required them to not only complete the test but to read the personality type description and to find the courses that match their personality type in order to complete the activities in the course book. Furthermore, the card sort activity enabled students to identify the values that were important to them. These activities provided mastery experiences for each individual of the different career decision-making tasks as the course progresses.

Opportunities for vicarious experiences were provided in students' participation in informational interviews where they learned more about specific careers through speaking to people in these careers. In addition, the activity on role models allowed students to learn more about career decision-making through the experiences of these inspirational figures.

The course was conducted in a supportive and positive environment and the instructor was intentionally encouraging in the comments and feedback given to students concerning career decision-making throughout the course. Therefore it was felt that verbal persuasion and positive influences were amply provided in this course.

According to Bandura (1986), people judge their capabilities and strengths based on their physiological and emotional states. For example, if students are anxious and/or possess negative or self-defeating thoughts about career decision-making, they will be less confident in making career decisions. Therefore, in order to help students manage their physiological and emotional states, session four on problem-solving and decision-making focused on identifying and assessing external obstacles, self-imposed limitations, thoughts or feelings that hinder the decision-making process, and to help students develop problem-solving skills. In addition, students were also exposed to role models who overcame difficult circumstances in their journey to success. Furthermore, students were guided on how to deal with career decision-making issues (for example, conflicts with parental expectations, influence from friends, and financial constraints) in an optimistic manner, and they were also reminded to focus on the possibilities instead of the obstacles.

5.9 Integration of Brown and Ryan Krane's five critical components

The five critical components identified by Brown and Ryan Krane (2000) were also integrated into the course. First of all, the course was guided by a course book with specific tasks and written exercises for all four sessions. In the first session, participants were required to list their specific career decision-making concerns, and write their goals for the course. In addition, they were asked to list their top personal values, answer questions on their interests, skills, and achievements. Furthermore, they were asked to identify and describe their personality in the space provided. In the second session, participants were

required to identify and describe the people, environment and lifestyle preferences in order to find careers that suit them. They were also asked to list and rank work values from most to least important. The course book provides guidelines to conduct the informational interviews and space to summarise and write their interviews. In the third session, participants were asked to write their goals and plans for the future, and list strategies that they can adopt to turn their goals and dreams to reality. In the fourth and final session, participants were asked to identify and write if there they have negative or self-defeating thoughts that they need to overcome and to list the steps to take to do so. They were also asked to describe the lessons on career decision-making that they have learned from the handout on role models. Finally, they were required to suggest ways to get their parents to support their career decision.

Secondly, during the second session, participants were asked to consult individually or in groups with the instructor regarding their career assessment scores, goals, career plans, and any other area of career decision-making that was covered in the course. A schedule detailing the times that the instructor would be in college was disseminated and students were encouraged to make appointments.

Thirdly, participants were exposed to different kinds of careers, and information on accessing resources on careers was discussed in the second session along with the online resources that provided guidance on making course or career decisions that were listed on the back of the course book.

Fourthly, the ‘modelling’ component was covered within the activities on role models where students learn through the inspirational experiences of people who overcame challenges to achieve success.

Finally, attention to building support was discussed in the fourth session where different ways or approaches to garner the support of significant others for their decisions were proposed. In addition, the definition of a mentor and ways to find one were also discussed.

Table 5.1 depicts the contents of the course and the sessions and activities that integrate Crites’ (1978) Career Maturity Theory, Bandura’s (1986) four sources of information and Brown and Ryan Krane’s (2000) five critical components. The table shows the session that corresponds with Crites’ (1978) career choice competencies. It also shows the different sessions and activities where students are exposed to and participate in Bandura’s four sources of information on which self-efficacy is modified. Finally, it also shows how the five critical components by Brown and Ryan Krane (2000) are integrated into the course.

Table 5.1

Contents of the course and the sessions and activities that integrate Crites' (1978) Career Maturity Theory, Bandura's (1986) four sources of information and Brown and Ryan Krane's (2000) five critical components.

Session	Topic	Activities	Take-home activity	Crites' (1978) Career Maturity Theory	Bandura's (1986) four sources of information	Brown and Ryan Krane's (2000) five critical components
1	My identity and motivation	Personal values card sort; Q&A on interests; skills checklist; career genogram	Jung Typology Test	(a) Accurate self-appraisal	(a) Performance accomplishments; (c) Verbal persuasion	(a) Workbook and written exercises (b) Individualised interpretations and feedback
2	The world of work	Self-directed Search; Q&A on people, environments and lifestyles; ranking of work values, identify resources for job search and information	Informational interviews	(b) Gathering occupational information	(b) Vicarious experiences; (c) Verbal persuasion	(a) Workbook and written exercises (b) Individualised interpretations and feedback (c) World of work information
3	Targets and plans	Career fantasy; career timeline; short-term and long-term goals; action planning, going to university; getting a scholarship	Personal statement	(c) Goal selection (d) Making plans for the future	(a) Performance accomplishments; (c) Verbal persuasion	(a) Workbook and written exercises (b) Individualised interpretations and feedback
4	Problem-solving and decision-making	Case study on problem-solving; problem-solving process; decision-making ideas; handout on role models	Reflection on lessons and activities	(e) Problem-solving	(d) Physiological and emotional states; (c) Verbal persuasion	(a) Workbook and written exercises (d) Modelling (e) Attention to building support

5.10 Chapter summary and conclusions

Overall, the design of the course and its objectives, content, topics, the activities, materials used, and the way it was conducted emphasised Crites' (1978) five key career choice competencies and incorporated the sources of self-efficacy (Bandura, 1977) and critical components (Brown & Ryan Krane, 2000).

In order to ensure that the above were integrated into the course, a companion instructor's manual for the course was developed. This manual provided careful instructions to the instructor about the timing of each activity, key points or lessons to emphasise, and the attitude and manner to adopt for each session. Sample pages of this manual can be found in Appendix F.

The next chapter presents the investigation and findings of the factor structure of the three main instruments for data collection on this study.

CHAPTER 6 – INVESTIGATION INTO THE FACTOR STRUCTURE OF MAIN INSTRUMENTS

6.1 Chapter overview

The main instruments for data collection in the present study are the Career Decision Self-Efficacy Scale – Short Form (CDSES-SF by Betz et al., 1996), the Career Decision Scale (CDS by Osipow et al., 1987), and the revised version of the Career Decision Difficulties Questionnaire (CDDQr by Gati & Saka, 2001b). These instruments are widely used in career counselling and interventions for college students. Although these instruments have been validated by numerous studies, there have been inconsistent findings regarding the factor structure of these instruments with cross-national populations. As the factor structure of these instruments has never been explored using a Malaysian sample, the findings of an investigation into the factor structure of these instruments will contribute to the validation of these instruments for use with a Malaysian population.

This chapter details the findings of an investigation into the factor structure of these three instruments with a Malaysian sample and addresses research question one: Do the three main instruments reliably measure the three constructs for Malaysian college students?

Research literature concerning the factor structure of each instrument is discussed in turn below.

6.2 Career Decision Self-Efficacy Scale – Short Form (CDSES-SF) by Betz et al. (1996)

The Career Decision Self-Efficacy Scale (CDSES) was developed by Taylor and Betz (1983) to measure self-efficacy expectations in carrying out tasks necessary for making career decisions. (A detailed description of this instrument and sample items can be found in Chapter four section 4.4.3) The subscales of the original Career Decision Self-Efficacy Scale (CDSES) with 50 items were based on the five career choice competencies of Crites' (1978) Career Maturity Theory. These competencies which formed the five subscales of the CDSES include Self-Appraisal (SA), Occupational Information (OI), Goal Selection (GS), Planning (P), and Problem-Solving (PS). However, studies investigating the factor structure of the CDSES reported varying results. According to Taylor and Betz (1983), their development study did not support a five-factor structure. Rather, it supported a single career decision-making self-efficacy factor. Taylor and Popma's (1990) study replicated the factor analysis and found a clearer group factor structure but 17 of the items still loaded on the first factor. Another study by Peterson and delMas (1998) found that their data supported a two-factor structure consisting of decision-making and gathering occupational information. However, the study by Gati et al. (1994) reported that when certain problematic items (based on low item-scale correlations and/or high correlations with other scales) were eliminated from the CDSES, the five factor structure emerged in cluster analysis.

As the 50-item instrument takes a longer time to complete, the short-form of

the CDSES was developed by eliminating five of the ten items from each of the subscales. The Career Decision Self-Efficacy Scale – Short Form (CDSES-SF) contains 25 items. Although the developers of the CDSES-SF, Betz et al. (1996) provided evidence of the five-factor structure of the scale with their study of a large but predominantly Caucasian American sample, studies with other populations and ethnic groups have shown that the factor structure of the CDSES-SF did not correspond with Crites' (1978) five career choice competencies on which the five subscales were based. For example, Creed, Patton and Watson (2002) reported three factors with an Australian and South African population; Chaney, Hammond, Betz and Multon (2007) found four factors with an African-American population; Hampton (2005) reported a three-factor structure with Chinese students; while Lee and Lee (2002, cited in Nam, Yang, Lee, Lee & Seol, 2011) using a Korean translated version of the scale, found their data with Korean students supported a four-factor model. Watson, Brand, Stead and Ellis (2001) also reported that the CDSES-SF subscales did not fit their South African sample.

According to Miller, Roy, Brown, Thomas, and McDaniel (2009), the failure to replicate the five-factor model originally posited by Betz et al. (1996) could be due to the different methodological approaches to data analysis used across studies. For example, studies that have examined the factor structure of the CDSES and CDSES-SF employed exploratory factor analysis (e.g., Creed et al., 2002) which is normally used to estimate the unknown structure of the data, and principal components analysis (e.g., Chaney et al., 2007; Peterson & delMas, 1998) which is used to summarise the information available from a

given set of variables and to reduce it into fewer number of components (Matsunaga, 2010). The more appropriate method would be to use confirmatory factor analysis (CFA), a method subsumed within Structural Equation Modelling (SEM), which is used to test an existing theory (Matsunaga, 2010). Using various fit indices, researchers are able to determine if an a priori model of the underlying structure of the target construct fits the data adequately (Matsunaga, 2010).

In their study with two samples of Asian American and European American students using CFA, Miller et al. (2009) found that the five-factor model of Betz et al. (1996) demonstrated an adequate fit to their data. However, it must be noted that even studies that used CFA like Hampton (2005) and Watson et al. (2001) were not able to produce the factor structure proposed by Betz et al. (1996). Miller et al. (2009) proposed that the discrepancy between their findings and those of Hampton (2005) and Watson et al. (2001) which used international samples, may be due to 'conceptual equivalence' (Miller et al., 2009) which refers to the meaningfulness of a construct across culturally distinct groups. They suggest that the career decision-making process may be different across cultures and therefore, some of the items of the CDSES-SF may hold different meanings for those outside the USA and may exhibit different patterns of relationships with other items, thereby accounting for the variance in factor structure across studies (Miller et al., 2009).

Given the discrepancy between findings of studies using American and non-American samples regarding the factor structure of the CDSES-SF (which was

used in the present study), it is important to test the structure of this model with a sample of Malaysian students. Moreover, to my knowledge, the factor structure of the CDSES-SF with Malaysian students had never been explored. Therefore, an exploration of the factor structure of the CDSES-SF with a Malaysian population will further extend our knowledge about the reliability and validity of the instrument across different cultures, and serve to answer research question one. This analysis has two primary purposes: (a) to test the five-factor model of Betz et al. (1996) via confirmatory factor analysis using a Malaysian sample, and if the data do not fit the model like the studies with other international samples, (b) to explore and propose the most appropriate measurement model of the CDSES-SF for Malaysian college students.

6.2.1 Method for analysing the CDSES-SF

6.2.1.1 Participants

The data for the investigation into the factor structure of the three main instruments were provided by participants of the two colleges in Malaysia who completed all three instruments at Time 1. This sample consisted of 692 students (N = 692). Male students constituted 41.9% of the sample while 58.1% were female. The students were aged between 16 and 19 with majority of students aged 18 (86.7%).

6.2.1.2 CDSES-SF

The CDSES-SF containing 25 items by Betz et al. (1996) was used in the analyses. English is the second language of Malaysia, and students in pre-university programmes, especially in the A Level programme that prepares students mostly for overseas study from which this sample of students was taken, are effectively bilingual. As such, the instrument was used as is without being translated. Responses are scored on a 5-point Likert-type scale, ranging from 'No confidence at all' (1) to 'Complete confidence' (5). Mean scores for the each subscale are obtained by summing the responses to the five items, and then dividing it by five. The mean score for the total scale was obtained by summing the responses to all 25 items and then dividing it by 25.

6.2.1.3 Preliminary analysis for the CDSES-SF

Values of coefficient alpha were computed for the total scale and the five subscales. The values were .91 for the total scale and .69 for self-appraisal, .65 for occupational information, .79 for goal selection, .76 for planning, and .60 for problem-solving. Betz, Hammond, and Multon (2005) reported values of .78 to .85 for the five subscales among 400 students and .80 to .84 in a sample of 603. These students were predominantly Caucasian. Similarly, Chaney et al. (2007) reported alphas of .78 (problem solving) to .85 (goal selection) for the CDSES-SF using the five level response continuum in a sample of 220 African American college students. Compared to this sample of Malaysian students, it appears that the reliabilities are slightly lower for problem-solving, self-appraisal and occupational informational, with problem-solving recording the lowest coefficient. This is consistent with the finding by Nilsson, Schmidt and

Meek (2002) who conducted a reliability generalisation study and reviewed 14 studies that employed the CDSES-SF. They reported that the problem-solving subscale had the lowest range of reliability coefficients (ie., .69 to .75) for these studies. Goal selection, which has been previously reported to be the most reliable subscale in earlier studies, was also observed in the present study to have the highest coefficient alpha of .79.

6.2.2 Factor analytic procedures for the CDSES-SF

The strategy adopted for data analyses was chosen following the examples of Miller et al. (2009), Hampton (2005) and Watson et al. (2001) who analysed their sample data using confirmatory factor analysis. Data analysis for the present investigation was conducted in three stages. In the first stage, the five-factor model of the CDSES-SF by Betz et al. (1996) was tested using CFA. If the data do not provide adequate fit to the model, exploratory factor analysis (EFA) would be performed in the second stage. Based on the results of the EFA, a CFA would be performed at the third stage to test the most appropriate measurement model of the CDSES-SF for Malaysian college students.

CFA was chosen because it enabled a factor structure to be specified a priori, the theoretical expectations of the underlying relations among the variables to be tested, and an evaluation to be conducted as to whether the proposed models fit the empirical data via measures of fit indices (Byrne, 2010). Furthermore, when used in testing model fit, SEM accommodates measurement error and it is the most suitable multivariate procedure for testing theoretical relationships

among multiple variables (Hair et al., 2010).

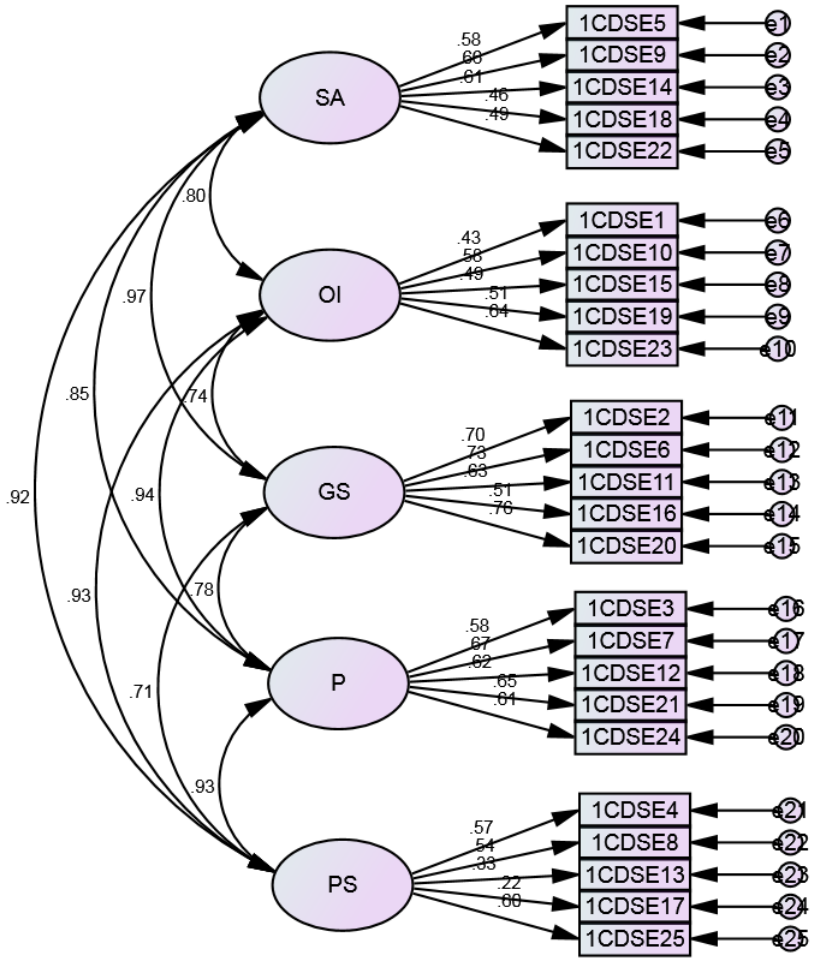
The statistical software AMOS 22 was used to conduct the CFA with Maximum Likelihood Estimation (MLE) to assess the adequacy of the model. Following the guidelines by Hair et al. (2010), four measures of fit were used to evaluate how well the data fit the model: (a) normed chi-square which is the chi-square value divided by the degrees of freedom (χ^2/df), (b) the goodness-of-fit index (GFI), (c) the comparative fit index (CFI), and (d) the root mean square error of approximation (RMSEA). The chi-square statistics are reported but are not used in evaluating goodness of fit because it is affected by model and sample size (Hair et al., 2010). For the normed χ^2, a value smaller than 2 is considered very good and between 3 and 5 is acceptable (Hair et al., 2010). The GFI and CFI statistics range from 0 to 1, and values greater than .90 indicate a good model fit (Byrne, 2010). For RMSEA, a value of .05 or less indicates a good fit although a value of between .05 and .08 indicates a reasonable fit, while a value of .10 or higher indicates a poor fit (Byrne 2010, Hair et al. 2010). These measurement criteria were used to determine model fit in the analyses of the three instruments.

6.2.3 Results for CDSES-SF

6.2.3.1 Stage one: Testing the five-factor structure using CFA

The five factor model corresponding with the five subscales of the CDSES-SF was examined using CFA. Based on the assessment of fit criteria above, the

results indicated that the five-factor model by Betz et al. (1996) did not provide an adequate fit to the data, with χ^2 (265) = 1296.25, $p < .001$, normed χ^2 = 4.89, GFI = .86, CFI = .82, and RMSEA = .08. Specifically, the normed chi-square was marginal, and the CFI and GFI indicated a poor fit. See Figure 6.1 for the original model (Model 1). Therefore, a decision was made to carry out exploratory factor analysis (EFA) to estimate empirically the number of factors of the CDSES-SF for Malaysian college students.



SA=Self-appraisal, OI=Occupational information, GS=Goal selection, P=Planning, PS=Problem-solving

Figure 6.1. CFA Model of Career Decision Self-Efficacy Scale – Short Form - Original Model.

6.2.3.2 Stage two: EFA to estimate number of factors

Exploratory factor analysis was performed to estimate empirically the number of factors of the CDSES-SF for Malaysian college students. Initially, a principal axis factoring (PAF) was conducted on the 25 items of the CDSES-SF with orthogonal rotation (Varimax) through SPSS 20.0. The Kaiser-Meyer-Olkin (KMO) measure verified the sampling adequacy for the analysis, KMO = .92 ('superb' according to Field, 2009), and all KMO values for individual items were > .75, which is well above the acceptable limit of .5 (Field, 2009). Barlett's test of sphericty x^2 (300) = 6,019.93, $p < .001$, indicating that correlations between items were sufficiently large for factor analyses (Field 2009). However, the results of this PAF were factorially complex and difficult to interpret because many items had double or triple loadings greater than .30 on more than one factor. Following the suggestion by Creed et al. (2002), a PAF with oblique rotation (Direct Oblimin) was then conducted. An oblique rotation simplifies the factors and variables by allowing the factors to be correlated (Hair et al., 2010).

A five-factor structure emerged for the CDSES-SF with eigenvalues greater than 1. The five factors in combination explained 53.72% of the variance. The percentages for which variance was accounted were 32.19%, 6.86%, 6.09%, 4.31% and 4.28%. Factor I included items 4, 5, 7, 8 and 12; Factor II included items 13,17 and 18; Factor III contained items 2, 6, 9, 16 and 20; Factor IV consisted of items 11, 14, 15 and 22; and Factor 5 contained items 1, 19, 21, 23, 24 and 25. Item 11 cross-loaded on Factors III and IV but it had a higher

loading for Factor IV and was retained in Factor IV. Items 3 and 10 had loadings below .30, and were removed from subsequent analyses. Although a five-factor structure emerged, the items that loaded highest on each factor did not correspond with the five subscales of the CDSES-SF except for Factor III in which four out of five items represented goal selection, and Factor V in which three out of six items represented occupational information. Factor I contained two items each from problem-solving and planning, and one item from self-appraisal. Factor II had items from problem-solving and self-appraisal. Factor IV contained items from goal selection, self-appraisal and occupational information. This five-factor solution contains 23 items.

As previous studies have found four- and three-factor solutions for various cross-national populations (e.g., Hampton, 2005; Chaney et al., 2007; Creed et al., 2002), a decision was made to also examine if other factor solutions provided a better fit to the data. Therefore, repeated EFA with PAF was performed on the data to constrain the number of factors to four and subsequently three only to examine if other factor structures fit the data before carrying out CFA on these models.

Based on results from PAF, the four-factor solution in combination explained 49.44% of the variance. The percentages for which variance was accounted were 32.19%, 6.86%, 6.09%, and 4.31%. Factor I included items 1, 15, 19, 21, 23, 24 and 25. Factor II included items 13, 17 and 18; Factor III contained items 2, 6, 9, 11, 16 and 20. Factor IV consisted of items 4, 5, 7 and 8. Item 12 cross-loaded on two factors and because both loadings were smaller than .40,

this item was removed from subsequent analyses. Items 3, 10, 14 and 22 had loadings below .30, and were also removed from subsequent analyses. Factor I contains four items from occupational information, and items from planning and problem-solving. Factor II consisted of items from problem-solving and self-appraisal. Factor III had all five items from goal selection and one item from self-appraisal. Factor IV had items from problem-solving, planning and self-appraisal. This four-factor solution contains 20 items.

The three-factor solution in combination explained 45.137% of the variance. The percentages for which variance was accounted were 32.19%, 6.86%, and 6.09%. Factor I included items 1, 3, 4, 7, 8, 10, 12, 15, 19, 21, 23, 24 and 25. Factor II included items 13, 17 and 18; Factor III contained items 2, 5, 6, 9, 11, 14, 16 and 20. Items 5 and 7 cross-loaded on two factors; and item 22 has loadings smaller than .30. These three items were removed from subsequent analyses. Factor I contains five items from occupational information, and items from planning and problem-solving. Factor III had all five items from goal selection and two items from self-appraisal. Factor II had items from problem-solving and self-appraisal. This three-factor solution contains 22 items.

6.2.3.3 Stage three: Testing alternative measurement models with CFA

Three models (five-, four- and three-factor solutions) were subsequently tested using confirmatory factor analysis (CFA).

Based on the assessment of fit criteria above, the results indicated that the five-factor model obtained through EFA provided a better fit to the data, with χ^2 (220) =868.22, $p < .001$, normed $\chi^2 = 3.95$, GFI = .90, CFI = .88, and RMSEA = .07. Specifically, the normed chi-square, GFI and RMSEA improved although the CFI indicated a poor fit. Taken together, the model provided an adequate fit to the data. See Figure 6.2 for the re-estimated model (Model 2).

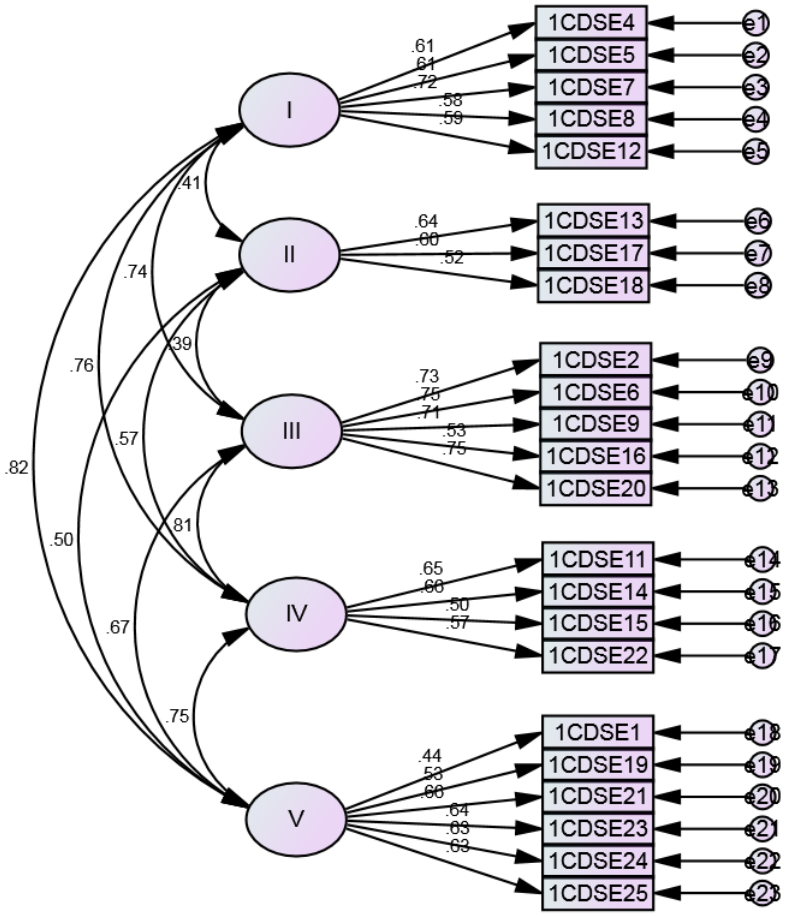


Figure 6.2. CFA Model of Career Decision Self-Efficacy Scale – Short Form - Re-estimated Model (Model 2).

However, comparing Models 3 and 4 (four factors and three factors respectively), Model 3 provided an even better fit to the data, with χ^2 (164) = 564.04, $p < .001$, normed $\chi^2 = 3.44$, GFI = .93, CFI = .91, and RMSEA = .06. Specifically, the GFI and CFI indicated a good fit. See Figure 6.3 for the model 3. Model 4 on the other hand did not provide a good fit to the data, with χ^2 (206) = 898.12, $p < .001$, normed $\chi^2 = 4.36$, GFI = .89, CFI = .86, and RMSEA = .07. See Table 6.1 for a comparison of the fit indices for the various models.

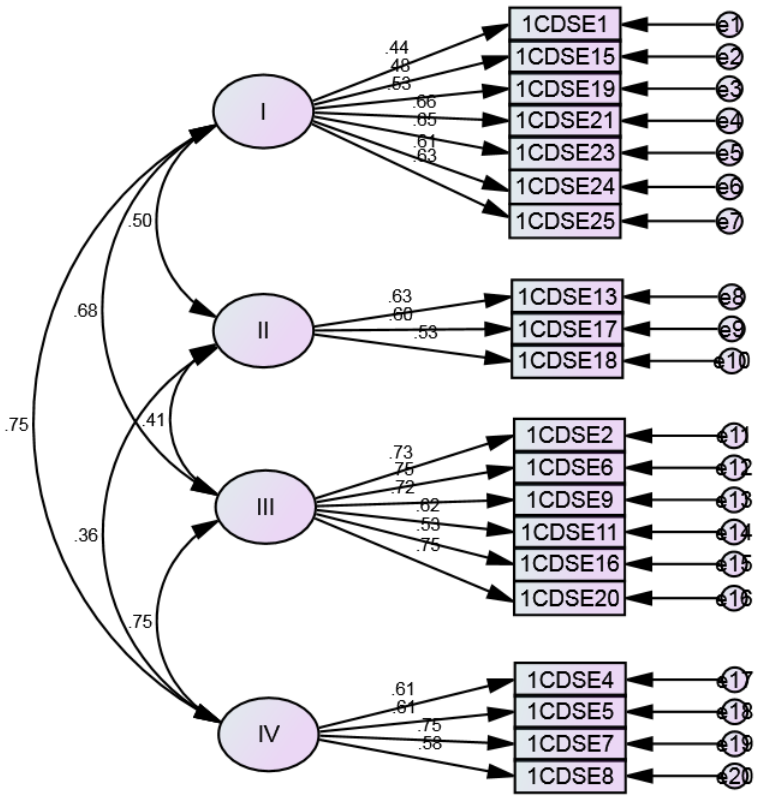


Figure 6.3. CFA Model of Career Decision Self-Efficacy Scale – Short Form - Model 3 (with four factors).

Table 6.1

CFA Goodness-of-Fit Statistics for three Models of the Career Decision Self-Efficacy Scale-Short Form (CDSE-SF) (N = 692)

Model	χ^2	*df*	*p*	χ^2/df	GFI	CFI	RMSEA
1 (Original as per Betz et al 1996)	1296.25	265	.000	4.89	.86	.82	.08
2 (Re-estimated five factors)	868.22	220	.000	3.95	.90	.88	.07
3 (Four factors)	564.04	164	.000	3.44	.93	.91	.06
4 (Three factors)	898.12	206	.000	4.36	.89	.86	.07

Note. χ^2 = chi-square; *df* = degrees of freedom; χ^2/df = normed chi-square, a value below 2 is very good while a value between 3 and 5 is acceptable; GFI = goodness-of-fit index; CFI = comparative fit index, and values greater than .90 indicate a good model fit; RMSEA = root mean square error of approximation, and values smaller than .08 indicate a reasonable fit

6.2.4 Discussion on the CDSES-SF

The purposes of this investigation were to test the five-factor model of the CDSES-SF by Betz et al. (1996) via confirmatory factor analysis using a Malaysian sample, and if the data did not fit the model, to explore and propose the most appropriate measurement model of the CDSES-SF for Malaysian college students.

The results revealed that the original five-factor model by Betz et al. (1996) did not provide a good fit to the data. While the empirically-derived 23-item five-factor model (based on results of EFA with the Malaysian sample) provided a better fit to the data, the five factors that emerged did not correspond with the theorised five career choice competencies on which the five subscales were

based except for goal selection and occupational information where most items from these subscales were found contained within two factors.

Four- and three-factor solutions were also proposed following the results from EFA. Although the four- and three factor solutions derived from EFA in combination accounted for a smaller portion of the variance compared to the five-factor solution, these two factor solutions were subsequently analysed because previous studies with non-American samples have shown that smaller factor solutions provided a better fit to the data. Subsequent CFA showed that the more parsimonious 20-item four-factor model provided an even better fit to the data.

In summary, the results of this investigation failed to replicate the five-factor model posited by Betz et al. (1996), but the findings are consistent with previous studies with non-American samples (e.g., Hampton, 2005; Watson et al., 2001) and minority groups in America (eg., Chaney et al., 2007). These findings provide support to Miller et al.'s (2009) suggestion that conceptual equivalence may be an issue for international samples, in that some of the items in the CDSES-SF may hold different meanings for populations outside of the USA.

Despite the discrepancy in the findings with a Malaysian population, the CDSES-SF remains a reliable instrument with high coefficient alpha for the total scale. Therefore, as suggested by Watson et al. (2001), the CDSES-SF should continue to be used as a general measure of career decision-making

self-efficacy for non-American populations until further psychometric evaluation of the subscales is undertaken. Given the potential utility of subscales within the CDSES-SF that correspond with the four factors in Model 3, further research is needed to validate the subscales derived empirically in the present investigation with another sample of Malaysian students and samples from other countries.

Based on the findings of this investigation, the 20-item four-factor solution derived empirically from the data with Malaysian students will be used in subsequent analyses. The subscales derived from this analysis will be renamed as follows: as Factor I contains four items from occupational information, this subscale will be known as *occupational information*; Factor II will be known as *problem-solving*; Factor III will be called *goal selection*; and Factor IV will be known as *decision-making* as it has a combination of items from problem-solving, planning and self-appraisal.

6.3 Career Decision Scale (CDS) by Osipow et al. (1976)

The Career Decision Scale (CDS) was developed by Osipow et al. (1976) to identify specific sources of career indecision in order to determine counselling interventions. The instrument is also widely used as a pre-post measure for interventions (Osipow, 1999). According to Sepich (1978), factor analyses in several studies revealed that the items on the CDS were not independent but could be separated into four factors: (1) a lack of structure and confidence, (2) approach-approach conflicts, (3) perceived external barriers to preferred

choice, and (4) personal conflict. However, other studies have shown that the number and structure of factors vary according to the populations. For example, the study by Hartman and Fuqua (1982) supported a two-factor solution, while Hartman and Hartman (1982) supported a three-factor solution.

According to Shimizu, Vondracek, Schulenberg and Hostetler (1988), inconsistent findings regarding the factor structure of the CDS could be the result of different factor analytic strategies used. For example, most studies used exploratory factor analysis with orthogonal rotational procedures such as Varimax. When Shimizu et al. (1988) recalculated seven previous studies that used Varimax rotation using the oblique solution Promax instead, they found that Promax-based coefficients portrayed less complexity and more similarity in factors across studies. In their study with 698 high school students, they found that Factor I indicated a feeling of indecision, confusion, discouragement and lack of experience. Factor II reflected relative decidedness about a future but a desire for support for the decision. Factor III indicated the classical approach-approach conflict where the respondents' positive feelings about their career possibilities that make a choice difficult. Factor IV reflected internal and external barriers to career decision making (Shimizu et al., 1988).

Although Osipow (1987a) has encouraged the use of the total indecision score as an overall index of one's level of career indecision, Shimizu et al. (1988) felt there is great utility for subscales within this instrument that correspond with the different factors. However, before the subscales can be used, factorial invariance has to be demonstrated across a variety of samples as this would

mean that the dimensions or factors measured by the instrument are stable across groups and populations (Shimizu et al., 1988). Shimizu et al. (1988) produced a factor loading pattern of the CDS that would permit further testing of factorial invariance of the CDS. Schulenberg, Shimizu, Vondracek and Hostetler (1988) used confirmatory factor analytic strategies to test for factorial invariance of factors derived from the CDS by Shimizu et al. (1988) with groups of junior high and high school students and found that the four-factor model provided a good fit to the data.

Given that the factor structure has never been tested (to my knowledge) with a Malaysian population, it would be interesting to find out if data from a Malaysian sample would support the four-factor model by Shimizu et al. (1988). Findings from this investigation will further extend our knowledge about this instrument and contribute to research on the factorial invariance of the CDS. This investigation has two primary purposes: (a) to test the four-factor model of the CDS proposed by Shimizu et al. (1988) via confirmatory factor analysis using a Malaysian sample, and if the data do not fit the model, (b) to explore and propose the most appropriate measurement model of the CDS for Malaysian college students.

6.3.1 Method for analysing the CDS

6.3.1.1 CDS

The CDS by Osipow et al. (1976) consists of the Certainty Scale (CS) (items 1

and 2) and the Indecision Scale (IS) (items 3 through 18). Item 19 is an open-ended question which is not scored. Items 3 through 18 from the IS were used in the analyses only. As mentioned previously, English is the second language of Malaysia, and students on pre-university programmes are effectively bilingual. As such, the instrument was used as is without being translated. Responses are scored on a 4-point Likert-type scale, ranging from 'Not like me' (1) to 'Like me' (4). The mean score for the total indecision scale was obtained by summing the responses to all 16 items and then dividing it by 16.

6.3.1.2 Preliminary analysis of the CDS

Several studies have reported internal consistency and test-retest reliabilities of the CDS. Studies have reported high α coefficient scores for IS ranging from .89 to .90 (Betz & Voyten, 1997; Guay et al., 2003; Mau, 1995). Osipow et al. (1976) reported test-retest reliability of the IS to be .90 and .82 for two samples of college students over a two-week period. Clear support has been reported for the construct and concurrent validity of the scale (eg Slaney, 1980; Osipow & Schweikert, 1981). A comprehensive review of the scales reliability and validity can be found in the CDS manual (Osipow, 1987b). In the present study, Cronbach's alpha for the total scale was .85 indicating a high level of internal consistency.

6.3.1.3 Model specification for the CDS

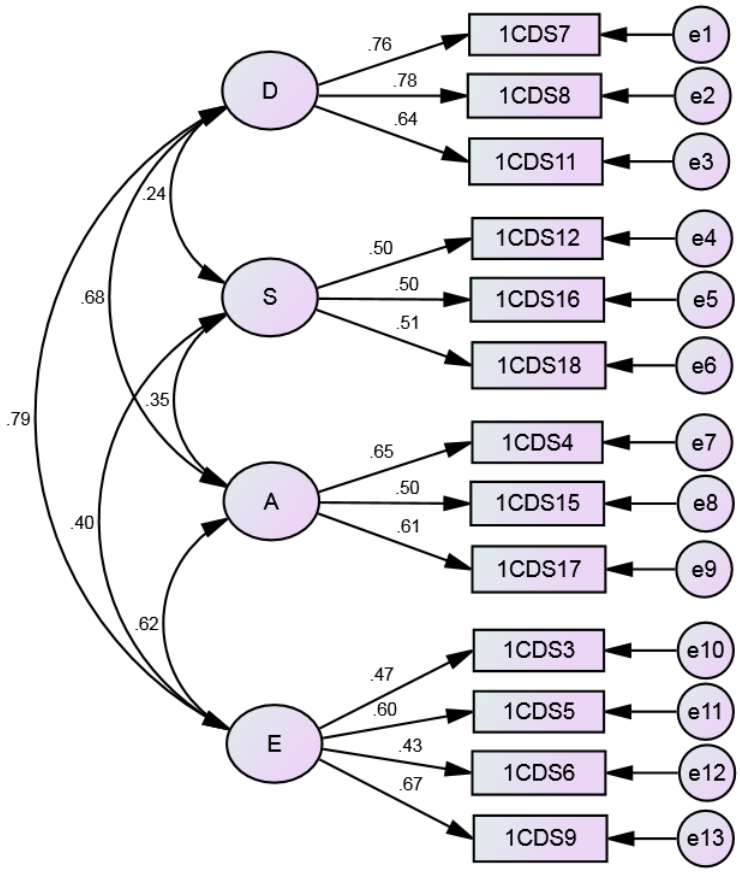
Shimizu et al (1988) proposed two factor patterns termed "Complex" and

"Simple." The complex model contained all 16 items (with factor loadings of 0.2 and above) and included items that loaded on more than one factor. The simple model contained 13 items with factor loadings of 0.4 and above, and all items are permitted to load on only one factor. Schulenberg et al. (1988) tested both complex and simple patterns with their data and found that both patterns provided an acceptable fit to the data. In view of the fact that a more parsimonious instrument is preferred, the simple model (with three items excluded) was tested in this study.

The hypothesised factor pattern was drawn directly from the four-factor oblique solution obtained by Shimizu et al. (1988). Factor I consisted of items 7, 8 and 11. Factor II contained items 12, 16 and 18. Factor III consisted of items 4, 15 and 17. Factor IV contained items 3, 5, 6 and 9. As items 10, 13 and 14 did not load saliently on any factor, these items were excluded in the model. This 13-item model was analysed.

6.3.2 Results for the CDS

Based on the assessment of fit criteria above, the result indicated that the four-factor model by Shimizu et al. (1988) did not provide an adequate fit to the data, with χ^2 (59) = 266.37, $p < .001$, normed $\chi^2 = 4.52$, GFI = .94, CFI = .89, and RMSEA = .07. Specifically, the normed chi-square was marginal, and the CFI indicated a poor fit. See Figure 6.4 for the original model (Model 1).



D=Diffusion, S=Support, A=Approach-approach conflict, E=External barriers.

Figure 6.4. CFA Model of Career Decision Scale – Original Model as per Shimizu et al. (1988).

Therefore, a decision was made to re-estimate the model that better represented the sample data and yet maintained the four-factor structure. This was achieved by deleting items that had large modification indices/standardised residuals as these items are indications of misfit resulting from a complex pattern of multiple loading or a high degree of overlap in item content (Byrne, 2010). Items were deleted one by one to study changes in parameter estimates, modification indices and standardised residuals, until a model that met the assessment of fit criteria emerged.

Only one item (item 15) was deleted so instead of three items, Factor III contained two items. As indicated by the following fit indices, this re-estimated 12-item model of the CDS provided an adequate fit to the data, with χ^2 (48) = 187.86, $p < .001$, normed $\chi^2 = 3.91$, GFI = .96, CFI = .92, and RMSEA = .07. See Table 6.2 for a comparison of fit indices of the two models.

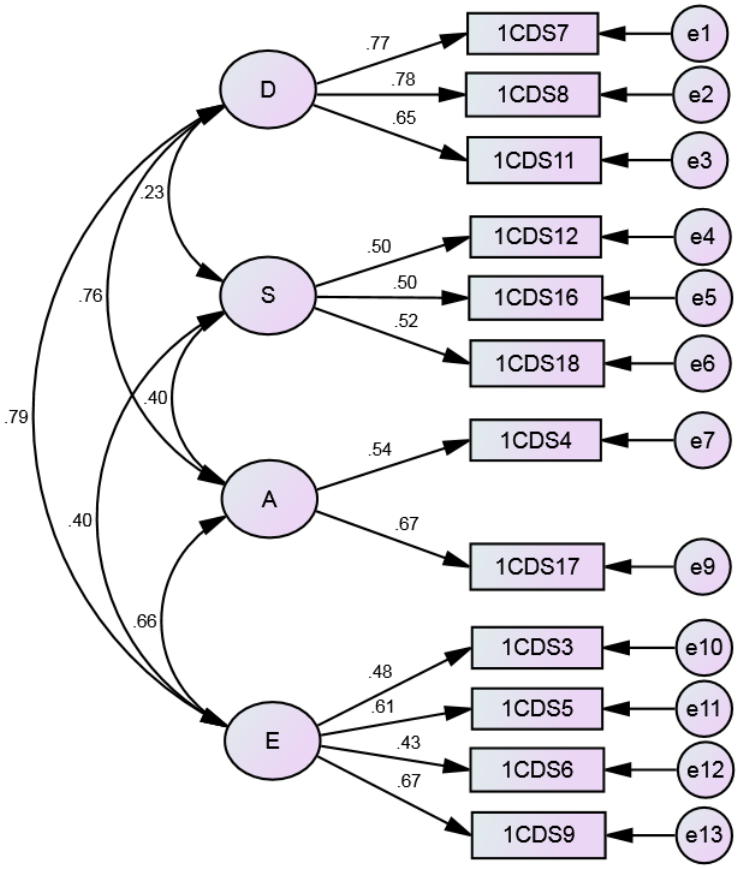
Table 6.2

CFA Goodness-of-Fit Statistics for two Models of the Career Decision Scale (CDS) (N = 692)

Model	χ^2	*df*	*p*	χ^2/df	GFI	CFI	RMSEA
1 (Original as per Shimizu et al., 1988)	266.37	59	.000	4.52	.94	.89	.07
2 (Re-estimated)	187.86	48	.000	3.91	.96	.92	.07

Note. χ^2 = chi-square; *df* = degrees of freedom; χ^2/df = normed chi-square, a value below 2 is very good while a value between 2 and 5 is acceptable; GFI = goodness-of-fit index; CFI = comparative fit index, and values greater than .90 indicate a good model fit; RMSEA = root mean square error of approximation, and values smaller than .08 indicate a reasonable fit

Figure 6.5 depicts the re-estimated model (Model 2).



D=Diffusion, S=Support, A=Approach-approach conflict, E=External barriers.

Figure 6.5. CFA Model of Career Decision Scale – Model 2 (with one item removed).

6.3.3 Discussion on the CDS

The purposes of this investigation were twofold: to test the four-factor model of the CDS proposed by Shimizu et al. (1988) using a Malaysian sample, and if the data did not fit the model, to explore and propose the most appropriate measurement model of the CDS for Malaysian college students.

The results revealed that the four-factor model proposed by Shimizu et al. (1988) did not adequately fit the data. However, by removing just one item, the

re-estimation provided a model that better described the sample data (e.g., the normed chi-square reduced from 4.52 to 3.91; CFI increased from .89 to .92, and RMSEA reduced from .071 to .065). This finding suggests that the 12-item re-estimated model may better reflect the four subscales corresponding to the four factors proposed by Shimizu et al. (1988) in a Malaysian sample.

Although the findings of this investigation provided some support for the use of subscales corresponding to the four factors of the CDS, the re-estimated model needs to be further cross-validated with another sample of Malaysian students to check for factorial invariance. However, another sample of Malaysian students could not be obtained as it is beyond the scope of this research project. Therefore, further tests of the equivalence of the four-factor solution across samples are needed before subscales consisting of the various items proposed can be used confidently. Furthermore, there may be other models that fit the assessment criteria but have not been explored in this study. Further research with other samples should also examine if other models would improve the fit.

For the purposes of the present study, the CDS was used as a global measure of indecision. Therefore, the subscales corresponding with the four factors proposed by Shimizu et al. (1988) will not be used in subsequent analyses. The IS will be used as a unidimensional scale instead following the suggestion by Osipow (1987b).

6.4 Career Decision Difficulties Questionnaire revised version (CDDQr) by Gati and Saka (2001b)

The CDDQ containing 44 items was developed to test and validate the taxonomy of career decision-making difficulties by Gati, Krausz and Osipow (1996). This taxonomy of career decision-making difficulties consists of three major categories (namely, *lack of readiness*, *lack of information* and *inconsistent information*) which are further divided into 10 specific difficulty subcategories. The Lack of Readiness category includes three subcategories of difficulties: (a) *lack of motivation*; b) *general indecisiveness*, and (c) *dysfunctional beliefs*. The Lack of Information category includes four subcategories of difficulties: (a) lack of information about the steps involved in the *process*; (b) lack of information about the *self*; (c) lack of information about various *alternatives* (work); and (d) lack of information about the *ways of obtaining additional information*. The Inconsistent Information category includes three subcategories of difficulties: (a) *unreliable information*; (b) *internal conflicts*; and (c) *external conflicts*. As a later instrument, the CDDQ allows for a more detailed evaluation of specific career decision-making difficulties, and is used as a needs assessment instrument of groups, and in evaluating the effectiveness of interventions (Gati, Saka & Krausz, 2001; Fouad et al., 2009).

The developers of the CDDQ tested the instrument with two young adult samples from Israel and America and found that the empirical pattern of relationships among the 10 subcategories was similar for both samples

indicating that the instrument can be used for cross-cultural populations (Gati et al., 1996). Researchers examining the construct and validity of this taxonomy have found empirical support in a variety of populations. For example, Albion and Fogarty (2002) in their study with high school students in Australia confirmed the multidimensional structure of the CDDQ and their proposed model, that also incorporates personality variables, suggests that a common pattern of difficulties exists for people of different age groups. Tien (2005) examined the properties and structure of the Chinese version of the CDDQ with Taiwanese students and found that the empirical structure of the instrument was similar to the theoretical model proposed by Gati et el. (1996). However, Mau (2001) in studying the cultural relevance of the CDDQ in other samples, found that the taxonomy fits less well with Taiwanese students compared to American students suggesting that the structure of decision-making difficulties may vary as a function of cultural differences. His findings suggest that culture may be a significant factor in career decision-making (Mau 2001).

In order to make the instrument more accessible, it was shortened to 34 items by deleting those items that did not significantly contribute to the scales' internal consistency-reliability (CDDQr by Gati & Saka 2001b). In their study with high school Israeli students in grades nine, 10 and 11, Gati and Saka (2001a) found that the structure of the shorter version of the instrument corresponded to the taxonomy proposed by Gati et al. (1996). Gati and Saka (2001b) also found that the shorter Internet-based Hebrew and English versions of the CDDQ are equivalent to the longer paper-and-pencil administration

among Israeli and American college students. Beyond these two studies, the CDDQr has not been tested (to my knowledge) with other cross-national populations.

Given that this taxonomy has not been investigated with a Malaysian population that more closely resembles Taiwanese students in that Malaysia practises more collectivist norms being an Asian country, the findings will extend our knowledge of the suitability of this instrument for use with this population. Moreover, Mau (2001) used the 44-item CDDQ while the present study used the 34-item CDDQr (Gati & Saka 2001b) which has not been validated using a Malaysian sample. Furthermore, while scale reliabilities obtained from Gati and Saka's (2001b) study replicated previous findings (Gati et el., 1996; Gati et al., 2000; Osipow & Gati, 1998), the consistently low reliability of the *dysfunctional beliefs* scale merits further investigation.

The primary purpose of this investigation was to determine if the taxonomy of career decision-making difficulties by Gati et al. (1996) can be applied to Malaysian college students. To determine if the taxonomy of career decision-making difficulties can be applied to Malaysian college students, confirmatory factor analysis via structural equation modelling (SEM) was used to examine the structure of the instrument used to measure the taxonomy. Previous analysis of the structure of the CDDQ was performed using cluster analysis via ADDTREE (except for two studies by Mau, 2001, and Albion & Fogarty, 2002).

6.4.1 Method for analysing the CDDQr

6.4.1.1 CDDQr

The 34-item CDDQr by Gati and Saka (2001b) was used in the analyses. As mentioned earlier, English is the second language of Malaysia, and students in pre-university programmes are effectively bilingual. As such, the instrument was used as is without being translated. Responses are scored on a 9-point Likert-type scale, ranging from 'Does not describe me' (1) to 'Describes me well' (9). Mean scores for the each subcategory were obtained by summing the responses to the items, and then dividing it by the number of items. The mean scores for the main categories were obtained by summing up the mean scores of subcategories and then dividing it by the number of subcategories. The total scale was obtained by summing the mean scores of all ten subcategories, and dividing it by 10.

6.4.1.2 Preliminary analysis of the CDDQr

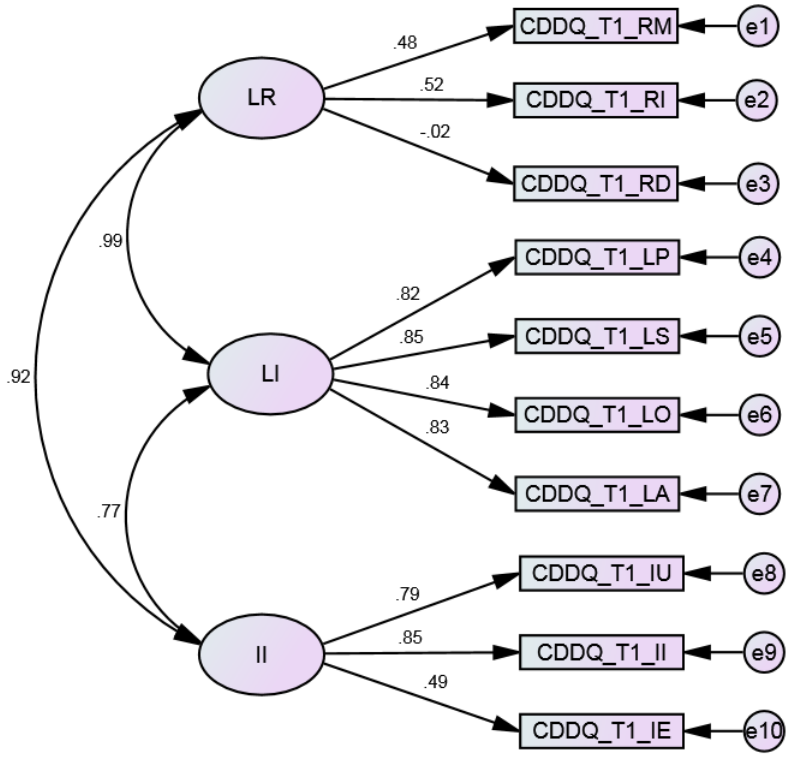
Gati and Saka (2001b) reported internal consistencies with α coefficients ranging from .34 to .84 for the 10 subcategories of difficulties with their sample of high school students with the Lack of Readiness category (specifically dysfunctional beliefs) recording the lowest scale reliabilities. Gati and Amir (2010) reported median test-retest reliability for the three categories was .74 and that of the total CDDQr was .79. They also reported median Cronbach's α internal consistency reliability estimate of the three categories

was .86 and that of the total instrument was .94. In the present study, reliability analyses indicate the internal consistency on the total scale was .92. Coefficient alpha for the subscales were .57 (lack of readiness), .94 (lack of information), and .83 (inconsistent information).

6.4.2 Results for the CDDQr

The main purpose was to determine if the taxonomy of career decision-making difficulties by Gati et al. (1998) could be reliably applied to a Malaysian sample. The model was examined using confirmatory factor analytic approach via the structural equation modelling (SEM) technique. The 34-item instrument was hypothesised to represent the three main categories of career decision-making difficulties (ie., lack of readiness, lack of information, and inconsistent information) which were further divided into 10 subcategories of difficulties.

Based on the assessment of fit criteria above, the results of the Malaysian sample indicated that the taxonomy by Gati et al. (1996) provided a good fit to the data, with χ^2 (32) = 112.01, $p < .001$, normed $\chi^2 = 3.50$, GFI = .97, CFI = .97, and RMSEA = .06. All paths were significant except the dysfunctional beliefs-lack of readiness path (-.02, $p > 0.5$). See Figure 6.6 for the taxonomy by Gati et al. (1996).



LR=Lack of Readiness, LI=Lack of Information, II=Inconsistent information, RM=Lack of motivation, RI=Indecisiveness, RD=Dysfunctional beliefs; LP=Lack of information regarding the process, LS=Lack of information regarding self, LO=Lack of information regarding occupations, LA=Lack of information regarding additional ways of obtaining information, IU=Unreliable information, II=Internal conflict, IE=External conflict.

Figure 6.6. CFA Model of Career Decision-Making Difficulties – Original Model.

As the dysfunctional beliefs-lack of readiness path was non-significant, a decision was made to remove this subcategory to find out if it would improve the model fit. The results show that the revised model without the dysfunctional beliefs subcategory did not further improve the model fit for the data, with χ^2 (42) = 95.49, $p < .001$, normed χ^2 = 3.98, GFI = .97, CFI = .98, and RMSEA = .07. However, this model also provided an acceptable fit to the data. See Table 6.3 for comparison of fit indices of the two models.

Table 6.3

Goodness-of-Fit Statistics for two Models of the Career Decision-Making Difficulties Questionnaire (CDDQr) (N = 692)

Model	χ^2	*df*	*p*	χ^2/df	GFI	CFI	RMSEA
1 (Original as per Gati et al., 1996)	112.01	32	.000	3.50	.97	.97	.06
2 (With the dysfunctional beliefs subcategory removed)	95.49	24	.000	3.98	.97	.98	.07

Note. χ^2 = chi-square; *df* = degrees of freedom; χ^2/df = normed chi-square, a value below 2 is very good while a value between 3 and 5 is acceptable; GFI = goodness-of-fit index; CFI = comparative fit index, and values greater than .90 indicate a good model fit; RMSEA = root mean square error of approximation, and values smaller than .08 indicate a reasonable fit

6.4.3 Discussion on the CDDQr

The purpose of this investigation was to examine if the taxonomy of the career decision-making difficulties as measured by the CDDQr (Gati & Saka, 2001b) can be adequately applied to describe the data for Malaysian college students. The results revealed that there was an adequate fit of model for the Malaysian sample, suggesting that the taxonomy of career decision-making difficulties can be reliably measured using the CDDQr for Malaysian college students. This is consistent with the findings of previous studies with Israeli and American students (Gati et al., 1996; Gati & Saka, 2001a; Gati & Saka, 2001b; Osipow & Gati, 1998). The finding of the non-significant path for dysfunctional beliefs-lack of readiness was also consistent with the findings by Mau (2001) in his sample of American and Taiwanese students. However, the results of the present investigation contradict Mau's (2001) study which found that the taxonomy of career decision-making difficulties proposed by Gati et al. (1996) did not fit his Taiwanese sample of college students. This discrepancy

could be due to the fact that Mau (2001) used a translated Chinese version of the instrument whereas the Malaysian sample used the original English version by Gati and Saka (2001b). Furthermore, Mau (2001) used the earlier 44-item version of the CDDQ while the present investigation is based on the 34-item revised version.

Although the findings of this investigation provided support for the CDDQr in adequately measuring career decision-making difficulties for Malaysian college students, the findings cannot be generalised to include all Malaysian college students. Further research with a different sample of Malaysian students is necessary to provide further validation of the instrument for Malaysian students. Furthermore, there may be other models that fit the assessment criteria but have not been explored in this study as it is beyond the scope of this investigation. Further research with other samples should also examine if other models would improve the fit.

As the findings of this investigation reveal that the taxonomy of career decision-making difficulties can be reliably measured using the CDDQr for this sample of Malaysian college students, the total CDDQr and its main and subcategories will be used in subsequent analyses.

6.5 Chapter summary and conclusions

One of the research aims of the present study is to examine the factor structure of the three main instruments used for data collection as previous studies have

been conducted using mostly Western populations. Therefore an examination of the factor structure of these instruments with a Malaysian population will further extend our knowledge about the reliability and validity of these instruments across different cultures.

This chapter addresses the first research question on whether the three main instruments are able to reliably measure the three constructs for Malaysian college students. Three hypotheses corresponding with the three main instruments were proposed in response to this research question.

Firstly, it was hypothesised that the original five factor model of the CDSES-SF (Betz et al., 1996) will not provide a good fit to the data on Malaysian college students. This was because studies with non-American and minority American samples were not able to replicate the original five-factor model by Betz et al. (1996). The results of the investigation into the factor structure of the CDSES-SF using a Malaysian sample revealed that it did not correspond with the five subscales posited by Betz et al. (1996). Thus, the hypothesis was supported. In fact, it revealed that a four-factor structure provided a better fit to the data, consistent with studies with minority groups in American (e.g., Chaney et al, 2007) and non-American samples (e.g., Hampton, 2005; Watson et al., 2001). These findings suggest that the CDSES-SF should be used as a general measure of career decision-making self-efficacy for non-American populations such as Malaysia. However, given the importance of subscales within the CDSES-SF, the four-factor solution derived empirically from the

data with Malaysian students (on which four revised subscales will be based) will be used subsequent analyses.

More recent psychometric analyses of the CDSES-SF (e.g., by Makransky, Rogers & Creed, 2014; Nam et al, 2011) suggest that the Rasch model approach could also be used to examine the validity of the CDSES-SF across different cultures and language versions because it uses the total score for the general CDSES-SF scale and the five subscales. The study by Nam et al. (2011) with Korean college students showed that the items of the CDSES-SF are unidimensional (with the exception of three items), while the results of the study by Makransky et al. (2014) with middle and high school students in Australian showed evidence of multidimensionality for the same scale. Given the equivocal findings by these two studies, future research could explore using this approach to investigate the dimensionality of the CDSES-SF across different settings. It is important to establish the dimensionality of the scale because this has implications on the use of the scale with different populations.

Secondly, it was hypothesised that data from a Malaysian sample will support the four factor structure of the CDS (Osipow et al., 1987). This hypothesis was supported because the findings of the investigation into the factor structure of the CDS showed that the data from Malaysian students supported a four factor solution corresponding to the four-factor model proposed by Shimitzu et al. (1988) except for one item that was subsequently removed. However, for the purposes of the present study, all 16 items of the IS will be used as a global measure of career indecision.

Thirdly, it was hypothesised that the CDDQr (Gati & Saka, 2001b) will reliably measure career decision-making difficulties among Malaysian college students. Based on the assessment of fit criteria, the results of the Malaysian sample indicated that the taxonomy of decision-making difficulties provided a good fit to the data. Therefore, this hypothesis was fully supported. As the CDDQr has been found to be a reliable measure for career decision-making difficulties for Malaysian college students, the total CDDQr and its main and subcategories will be used in subsequent analyses.

The findings of the present investigation into the factor structure of the three main instruments represents a significant contribution to research literature on psychometric testing and applicability of career decision-making measures in a different cultural context. For example, although the CDSES-SF has been widely used to assess the CDMSE construct, it appears that the use of the subscales may not be justified on a Malaysian sample, suggesting that more research into the psychometric properties of the subscales is needed for populations outside the USA. On the other hand, the findings of the factor structure of the CDDQr with a Malaysian sample provide support that this instrument is robust in measuring career decision-making difficulties among Southeast Asian students.

The psychometric properties and soundness of the three main instruments have now been established, and justification has been provided for their use in data collection. The next chapter goes on to describe in detail the pilot study that was conducted prior to the main study.

CHAPTER 7 – PILOT STUDY

7.1 Chapter overview

This chapter presents a detailed description of the pilot study that was carried out prior to the main study and its findings. A brief background of the research area; the purposes of the current investigation; the research questions and the hypotheses that were formulated specifically for the pilot study are discussed. Subsequently, the method and results are presented followed by a discussion of the findings, and the impact of the findings on the research design process of the main study. The chapter then concludes with a summary of the key points.

7.2 The current investigation

A review of the research literature in Chapter two revealed that there is a growing demand for career interventions to help students make career decisions (Fouad et al., 2006). However, there are few interventions that are theoretically based, and have been empirically tested. The review also identified a paucity of research in intervention-based outcome studies that relate career decision-making self-efficacy (CDMSE), career indecision and career decision-making difficulties. Therefore, the present study attempts to address these gaps in knowledge identified in the research literature by examining the effects of a career course on college students' CDMSE, career indecision, and career decision-making difficulties. This course is based on Crites' (1978) Career Maturity Theory, and incorporates the four sources of

information proposed by Bandura (1986) through which self-efficacy is modified in combination with Brown and Ryan Krane's (2000) five critical components of a career intervention. In addition, the relationships among these three constructs, and the role of gender will also be examined. Accordingly, several research questions and hypotheses were developed. However, before the main study was carried out, it was felt that a pilot study should be carried out for several reasons.

Primarily, the pilot study would permit preliminary testing of hypotheses that the intervention is effective in increasing CDMSE and in reducing career indecision and difficulties. In addition, data from the pilot study would also allow preliminary investigation of the relationship between CDMSE and career indecision; and between CDMSE and career decision-making difficulties. Furthermore, it would allow the preliminary examination of gender and career decision-making.

Secondly, it would provide invaluable insights into the research design. For example, it would enable the evaluation of the feasibility of the various measurement points, and to check students' comprehension of the three instruments and time needed to complete them. Thirdly, the pilot study would indicate the level of interest of the students in attending the course, and the attrition rate that was likely to occur over time. Therefore, it would provide some basis for the evaluation of proposed recruitment strategies for participants in the main study, as well as suggest ways of retaining them for the duration of the course. Finally, the pilot study would also provide the opportunity to

investigate the effectiveness of the activities planned in meeting the course objectives that have been outlined in Chapter five.

7.2.1 Research questions and hypotheses

Given the aims of the pilot study, several research questions and corresponding hypotheses have been formulated.

Research question one addresses the primary aim of the pilot study regarding the effects of the intervention on CDMSE, career indecision and decision-making difficulties. Based on the literature reviewed in Chapter three, interventions that incorporate the four sources of information proposed by Bandura (1986) on which self-efficacy is based, have been shown to result in positive outcomes for CDMSE. Therefore, it is hypothesised that the intervention will result in an increase in CDMSE. As several studies (e.g., Taylor & Popma, 1990; Betz & Voyten, 1999; Guay et al., 2003) have reported that CDMSE contributed significantly to the prediction of career indecision, it is hypothesised that the intervention will also result in a decrease in career indecision. Similarly, as career indecision is significantly and positively correlated with decision-making difficulties, it is hypothesised that the intervention will also result in a decrease in decision-making difficulties.

Research questions two and three address the investigation into the relationship between CDMSE and career indecision, and between CDMSE and decision-making difficulties. The research literature reviewed in Chapter three indicates

that few studies have examined the relationship between CDMSE and career indecision. Two studies (e.g., Grier-Reed & Skaar, 2010, and Creed et al., 2006) proposed that CDMSE and career indecision are not causally related while the relationship between CDMSE and decision-making difficulties have not been investigated in a longitudinal study. However, as the pilot study did not include a follow-up measurement point, only correlational analyses were conducted as preliminary examination of the relationship between constructs. It is therefore hypothesised that CDMSE will be moderately and negatively correlated with career indecision and decision-making difficulties

Research question four addresses the investigation into gender and career decision-making. Specifically, it is important to find out if male and female students respond differently to the intervention as this will have an impact on the design and development of interventions for students. Although the findings regarding gender and career interventions have been inconclusive in the studies reviewed in Chapter three, it is hypothesised that male and female students will respond differently to the intervention, because female students in collectivist societies (such as Malaysia) may not be given similar opportunities to make career decisions compared to male students (as suggested by Mau, 2000). Therefore, it was felt that interventions to help students make career decisions may have a greater impact on female students compared to male students.

(1) Research question one:

How does participation in the career course affect students' CDMSE, career indecision, and career decision-making difficulties?

Hypotheses:

1) Students will exhibit a significant increase in CDMSE post-intervention.

2) Students' overall career indecision will be reduced significantly after completing the course.

3) Students' overall career decision-making difficulties will be reduced significantly post intervention.

(2) Research question two:

What is the relationship between CDMSE and career indecision?

Hypothesis:

CDMSE is moderately and negatively correlated with career indecision.

(3) Research question three:

What is the relationship between CDMSE and career decision-making difficulties?

Hypothesis:

CDMSE is moderately and negatively correlated with career decision-making difficulties.

(4) Research question four:

Do male and female students respond differently to the intervention?

Although it is predicted that male and female students will respond differently to the intervention, a specific hypothesis concerning the amount of change on any of the three constructs is not advanced.

7.3 Method

7.3.1 Research design

A longitudinal repeated measures design where participants are measured at three time points – four weeks before the course commences (Time 1), immediately before the course starts (Time 2) and immediately after the course ends (Time 3) – was chosen because it best suited the purposes of the pilot study. This research design did not include a comparison group so the participants acted as their own control and underwent both conditions (with and without intervention).

7.3.2 Participants

College students aged between 16 and 19 years old enrolled in the A Level programme at two private pre-university colleges were invited to participate in the study during their orientation week. These were new students in their first week of college.

At Time 1, 319 students provided responses for the three instruments, but 23 students did not complete the questionnaire properly or were international students who were not the target participants of the study. After data cleaning, responses from 296 students were included in the analyses for Time 1.

Of the 296 students, 183 (61.8%) were female while 113 were male (38.2%). Ages of participants ranged from 16 to 19 with most students aged 18 (63.5%). Students were from 12 out of 15 states of Malaysia, indicating that students come from all over Malaysia to study in the Klang Valley[21]. This is also where most colleges and universities are located in Malaysia. Table 7.1 shows the demographics of these students.

Table 7.1

Demographic characteristics of students

		Frequency	Percentage
Gender			
	Female	183	61.8
	Male	113	38.2
Age			
	16	1	0.3

(continued)

[21] The Klang Valley refers to an area comprising Kuala Lumpur and most parts of Selangor. Official Website of Greater Kuala Lumpur/Klang Valley, Ministry of Federal Territories http://app.kwpkb.gov.my/greaterklkv/overview/ Accessed 1 April 2015

Table 7.1 (Continued)

	Frequency	Percentage
17	46	15.5
18	188	63.5
19	61	20.6
Course		
A Level	296	100
College		
Methodist College Kuala Lumpur	185	62.5
Taylor's College Subang Jaya	111	37.5
State where students are from		
Selangor	107	43.9
Kuala Lumpur	92	37.7
Sarawak	10	4.1
Perak	9	3.7
Johor	7	2.9
Negeri Sembilan	4	1.6
Pahang	4	1.6
Kedah	3	1.2
Melaka	3	1.2
Sabah	3	1.2
Terengganu	1	0.4
Pulau Pinang	1	0.4
Ethnic composition		
Chinese	271	91.6
Indian	18	6.1
Malay	4	1.4
Other	3	1.0

From the table above, it is evident that the demographics of students in this cohort are similar to students in the subsequent cohorts in the main study.

Although 182 students signed up for the course initially, only 126 students attended the first session of the career course and completed the instruments at Time 2. Finally, only 40 students attended all four sessions of the career course and completed the instruments again at Time 3. The retention rate was 31.75%.

The 40 participants who completed the course were aged between 17 and 19 years old. The mean age was 18.23. Of the 40 participants, 26 (65%) were

female and 14 (35%) were male. The majority of the participants were from Methodist College Kuala Lumpur (95%) while the remaining 5% were from Taylor's College Subang Jaya. As there were only two participants from one college, data from these were combined with data from participants from the other college and analysed together.

Seven states of Malaysia were represented in the sample, with the majority from Selangor (40%) and Kuala Lumpur (37.5%) where the two colleges are located. All 40 participants who completed the course were ethnic Chinese (100%).

7.3.3 Instruments

Effects of the intervention were measured using three instruments namely the Career Decision Scale (CDS by Osipow et al., 1976), the revised version of Career Decision Difficulties Questionnaire (CDDQr by Gati & Saka, 2001b), and the Career Decision Self-Efficacy Scale-Short Form (CDSES-SF by Betz et al., 1996). Based on findings in Chapter six, 20 items from the CDSES-SF will be used to form the total scale, while four subscales will be tested instead of five from the original scale.

The Indecision Scale (IS) of the CDS consisting of 16 items was used to measure career indecision. Cronbach's alpha for the IS for participants in the pilot study ranged from .73 to .78 at the three time points indicating a high level of internal consistency.

The coefficient alpha of the CDSES-SF total scale ranged from .86 to .88 at three time points indicating a high level of internal consistency. Coefficient alpha for the four subscales at Time 1 were .75 (occupational information), .53 (problem-solving), .79 (goal selection), and .74 (decision-making).

For the CDDQr, reliability analyses indicate the internal consistency of the total scale ranged from .87 to .91 at three time points. Coefficient alpha for the three main categories at Time 1 were .62 (readiness), .90 (lack of information), and .80 (inconsistent information).

These three instruments were combined into one questionnaire booklet called Making Career Decisions (MCD). The MCD was used as pre- and post-test measures.

7.3.4 Procedure

Permission was sought from two private colleges to carry out the research project. Once permission was granted, a briefing session about the career course was included in the orientation schedule for new A Level students. During the briefing session, a brief explanation about the career course was given and consent forms were distributed to all students present. Students who signed and returned the consent form were given the MCD questionnaire booklet. These booklets were collected immediately after students had completed them. This was the first time students filled in the questionnaire booklet and the briefing session was considered Time 1.

Registration forms for classes were also distributed for students to register for the session they wanted to attend that did not conflict with their academic and extracurricular activities' schedule. These forms provided an indication of the number of students who would attend the course so that materials could be prepared in advance. The same session was repeated four times a week to accommodate the students' busy schedules.

Despite reminders that were sent through email and text messages, many students who registered for the course during the briefing session did not attend the first session when it commenced four weeks later.

The MCD questionnaire booklets were distributed at the beginning of the first session (Time 2) and at the end of the last session four weeks later (Time 3). At both times, the booklets were collected immediately after they were completed. As participants had to complete the same instruments three times, counterbalancing of the three instruments was enforced to minimise order effects (Fife-Schaw, 2006). At Time 1, students completed the instruments in this order: CDSES-SF, CDS, CDDQr; whereas at Time 2, students completed the instruments in this order: CDS, CDDQ, CDSES-SF. At Time 3, students completed the instruments in the following order: CDDQ, CDS, CDSES-SF. Participants also filled in a feedback form at Time 3.

7.4 Results

7.4.1 Attrition analysis

As the retention rate for students was low between Time 2 and Time 3, it was important to investigate if the students who remained on the course (40) were different from those who dropped out of the study (84). Independent samples t-tests showed that those who dropped out did not differ from those who remained on all three variables: CDMSE, t (124) = 1.00, p = .318; career indecision, t (124) = -.54, p = .588; and career decision-making difficulties, t (124) = -1.05, p = .295.

7.4.2 Impact of intervention on CDMSE

A repeated measures ANOVA was carried out to determine if there were statistically significant differences in CDMSE as measured by the CDSES-SF over the three time points.

There was one outlier at Time 1 but this was not removed because it is not an extreme outlier based on inspection of boxplots and therefore would not materially affect the results. Data on CDMSE were normally distributed at each time point, as assessed by Shapiro-Wilk's test (Time 1, p = .874; Time 2, p = .179; Time 3, p = .575). Mauchly's test of sphericity indicated that the assumption of sphericity had not been violated χ^2 (2) = .94, p = .624. Scores for CDMSE were significantly different between Time 2 and Time 3 F(2,78) =

19.77, $p < .001$, partial $\eta^2 = .34$. Post-hoc analysis with a Bonferroni correction revealed that CDMSE increased significantly from Time 2 (pre-intervention $M = 2.97$, SD = .55) to Time 3 (post-intervention $M = 3.40$, SD = .52), a significant increase of 0.42, 95% CI [0.21, 0.63], $p < .001$ but not from Time 1 to Time 2, $p = 1.00$. Figure 7.1 shows the means scores for CDMSE at the three time points.

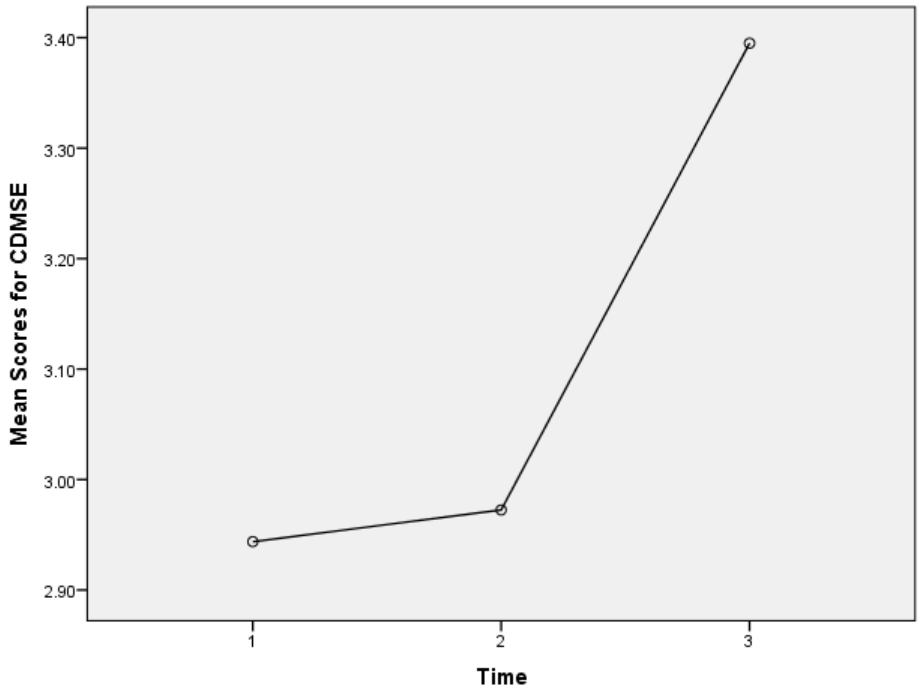


Figure 7.1. Mean Scores for Career Decision-Making Self-Efficacy at the three time points

Scores for all four subscales also increased significantly from Time 2 to Time 3 with the subscale *goal selection* experiencing the greatest increase of 0.50, $p < .001$ from pre-intervention ($M = 2.88$, SD = .65) to post-intervention ($M = 3.38$, SD = .61). The subscale *decision-making* experienced the least increase (0.35,

p = .035) from pre-intervention (M = 3.19, SD = .70) to post-intervention (M = 3.51, SD = .68).

7.4.3 Impact of intervention on career indecision

A repeated measures ANOVA was carried out to determine if there were statistically significant differences in career indecision as measured by the CDS over the three time points

For data on career indecision, there were a few outliers but these were not removed as they were not extreme outliers based on inspection of boxplots and should not materially affect the results. Data for CDS were normally distributed for Time 1 (p = .243) and Time 3 (p = .306), but not for Time 2 as assessed by Shapiro-Wilks' test (p = .009). However, a decision was made to run the repeated measures ANOVA anyway as this test is fairly robust to deviations from normality (Mayer, 2013). The assumption of sphericity was violated, as assessed by Mauchly's test of sphericity, $\chi^2(2) = 16.92$, $p < .001$. Therefore, a Greenhouse-Geisser correction was applied ($\varepsilon = 0.74$) following the suggestion by Maxwell and Delaney (2004). The intervention elicited statistically significant changes in career indecision from Time 2 to Time 3, $F(1.47, 57.38) = 6.62$, p = .006, partial η^2 = .15. Post-hoc analysis with a Bonferroni correction revealed that career indecision decreased significantly from Time 2 (pre-intervention M = 2.61, SD = .43) to Time 3 (post-intervention M = 2.41, SD = .45), a significant decrease of 0.20, 95% CI [0.02,

0.39], p = .024, but not from Time 1 to Time 2 (p = 1.00). Figure 7.2 shows the mean scores for career indecision for three time points.

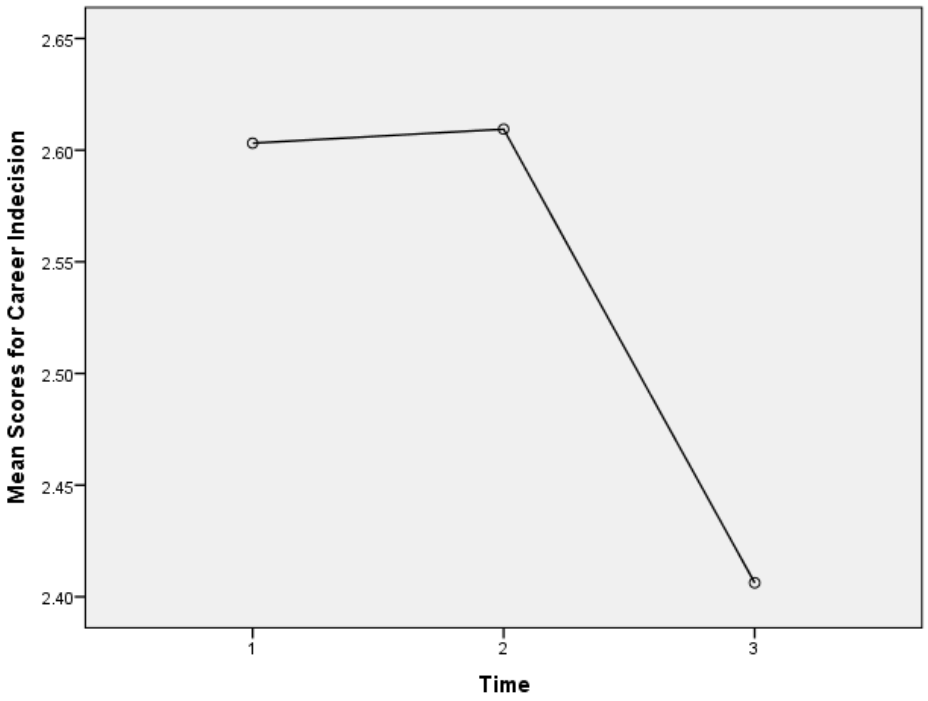


Figure 7.2. Mean Scores for Career Indecision at the three time points

7.4.4 Impact of intervention on career decision-making difficulties

There were a few outliers in the data on career decision-making difficulties but again these were not removed because they were not extreme outliers based on inspection of boxplots and would not materially affect the results. Data for career decision-making difficulties were normally distributed for Time 1 (p = .537) and Time 3 (p = .191) but were not normally distributed at Time 2 as assessed by Shapiro-Wilk's test (p = .003). However, a decision was made to run the repeated measures ANOVA anyway as this test is fairly robust to deviations from normality (Mayer, 2013). The assumption of sphericity was

violated, as assessed by Mauchly's test of sphericity, $\chi^2(2) = 22.11$, $p < .001$. Therefore, a Greenhouse-Geisser correction was applied ($\varepsilon = 0.69$) following the suggestion by Maxwell and Delaney (2004). The intervention elicited statistically significant changes in decision-making difficulties from Time 2 to Time 3, F (1.39, 54.13) = 20.18, $p < .001$, partial $\eta^2 = 0.34$. Post-hoc analysis with a Bonferroni correction revealed that decision-making difficulties decreased significantly from Time 2 (pre-intervention $M = 5.68$, SD = .95) to Time 3 (post-intervention $M = 4.87$, SD = .99), a significant decrease of 0.81, 95% CI [0.43, 1.19], $p < .001$), but not from Time 1 to Time 2, ($p = .631$). Figure 7.3 depicts the mean scores for career decision-making difficulties at the three time points.

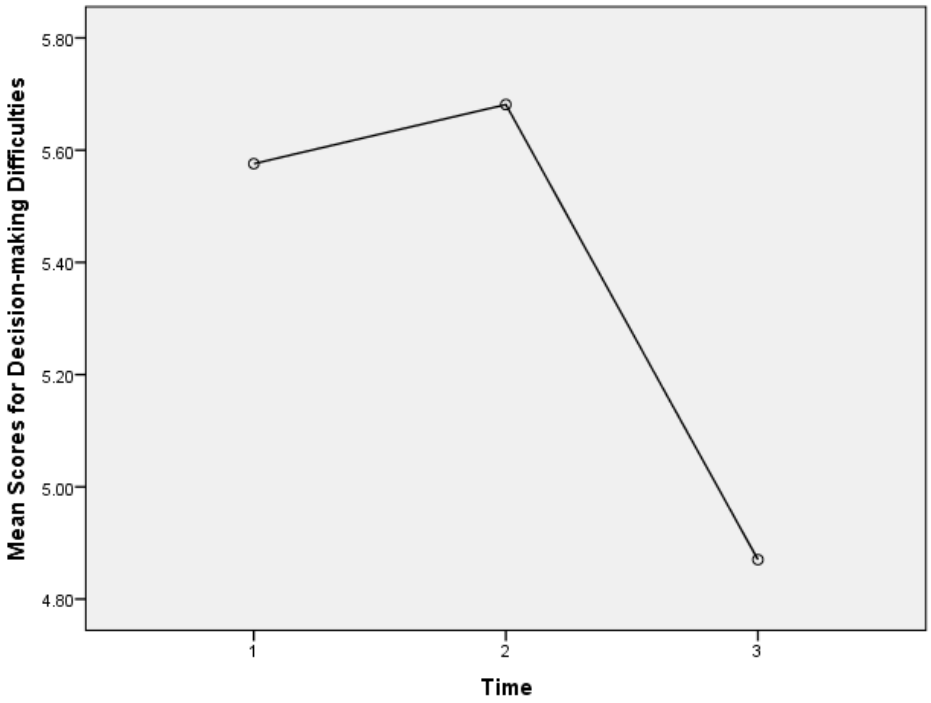


Figure 7.3. Mean Scores for Career Decision-Making Difficulties at the three time points

Scores for two of three main categories of difficulties decreased significantly post-intervention. The *lack of information* category decreased significantly from pre-intervention at Time 2 (M = 6.64, SD = 1.47) to post-intervention at Time 3 (M = 5.16, SD = 1.41), a significant decrease of 1.47, $p < .001$. On the other hand, although the scores for *inconsistent information* decreased post-intervention, the decrease was not significant ($p = .099$).

7.4.5 Relationship between CDMSE and career indecision

To better understand the relationship between CDMSE and career indecision, Pearson's correlations were conducted between the scales of each instrument (Tabachnick & Fidel, 2014). According to Tabachnick and Fidel (2014), correlational analysis is a preliminary step to determining the strength of the relationship between the DV and IV prior to performing regression analyses. The correlation coefficient is used to measure the size of the effect and values of ±.10, ±.30 and ±.50 can be interpreted as small, medium and large (Cohen, 1988; Field, 2009; Green & Salkind, 2014). As the pilot study did not include a follow-up measurement time point, subsequent regression analyses were not carried out. The following details the correlational analyses between CDMSE and career indecision.

At pre-test (Time 2, n = 126,), career indecision was significantly and negatively correlated with the subscale goal selection from the CDSES-SF (r = -.22, p = .012). However, a correlation of .22 would be considered weak (Cohen, 1988; Field, 2009; Green & Salkind, 2014). At post-test (Time 3), all

correlations between CDMSE and career indecision were not significant, but may be due to the small sample size (n = 40) (Mayer, 2013).

7.4.6 Relationship between CDMSE and career decision-making difficulties

Pearson's correlations revealed that at pre-test (Time 2, n = 126), the total CDSES-SF was significantly and negatively correlated with the total CDDQr (r = -.35, p = .001). The subscale *occupational information* was significantly and negatively correlated with main categories *lack of information* (r = -.33, p < .001) and *inconsistent information* (r = -.20, p = .025). *Goal selection* was significantly and negatively correlated with *readiness* (r = -.21, p = .018); *lack of information* (r = -.40, p < .001) and *inconsistent information* (r = -.28, p = .001). *Decision-making* was significantly and negatively correlated with *lack of information* (r = -.34, p < .001) and *inconsistent information* (r = -.21, p = .021).

At post-test (Time 3, n = 40), the CDSES-SF was significantly and negatively correlated with lack of information (r = -.35, p = .029). *Goal selection* was significantly and negatively correlated with *lack of information* (r = -.39, p = .013). *Decision-making* was significantly and negatively correlated with *lack of information* (r = -.46, p = .003) and the total CDDQr (r = -.42, p = .006). According to Cohen (1988), a correlation of between .35 and .46 would be considered moderate.

7.4.7 Gender and interventions

A repeated measures ANOVA was carried out with gender as the between-subject factor for the three constructs as measured using the CDS, CDSES-SF, and CDDQr, and the results showed that there was a statistically significant interaction between time and gender on career indecision [$F(2,76) = 6.91$, $p = .002$, partial $\eta^2 = .15$] and decision-making difficulties [$F(2,76) = 5.88$, $p = .004$, partial $\eta^2 = .13$]. The interaction between time and gender on CDMSE was not significant.

Pairwise comparisons revealed that career indecision decreased significantly for female students ($n = 26$) from Time 2 (pre-intervention $M = 2.70$, SD = .95) to Time 3 (post-intervention $M = 2.35$, SD = .36), a significant decrease of 0.35, 95% CI [0.18, 0.52], $p < .001$. However, the change in male students ($n = 14$) post-intervention was not significant ($p = 1.00$).

Figure 7.4 depicts the interaction effects of time and gender on career indecision.

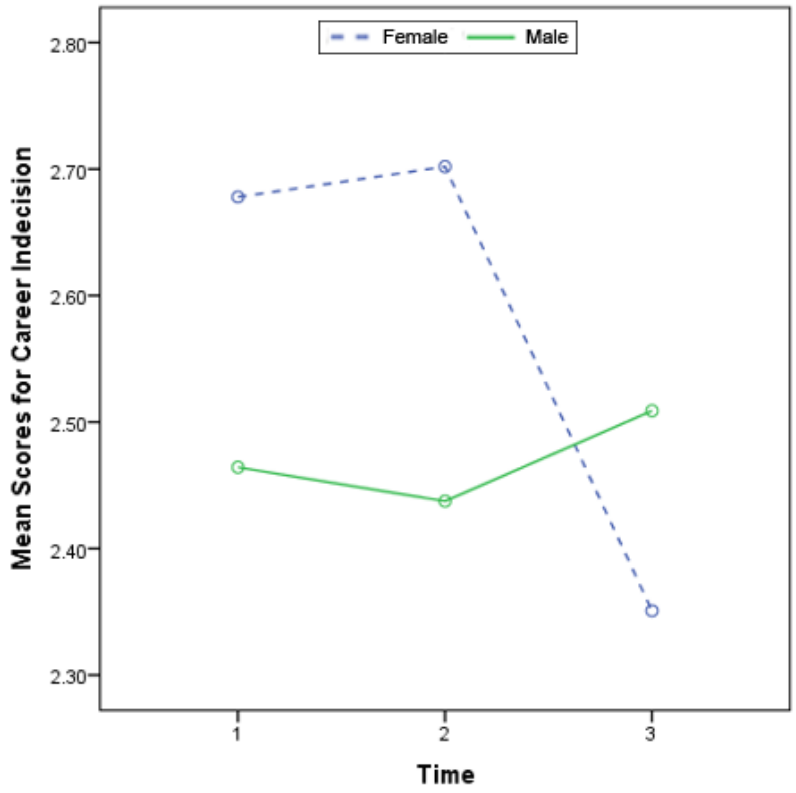


Figure 7.4. Significant interaction effects of time and gender on career indecision.

Similarly, pairwise comparisons revealed that career decision-making difficulties decreased significantly for female students from Time 2 (pre-intervention M = 5.88, SD = .62) to Time 3 (post-intervention M = 4.75, SD = .75), a significant decrease of 1.12, 95% CI [0.69, 1.55], $p < .001$. However, the change in male students post-intervention was not significant (p = 1.00). Figure 7.4 depicts the interaction effects of time and gender on career decision-making difficulties.

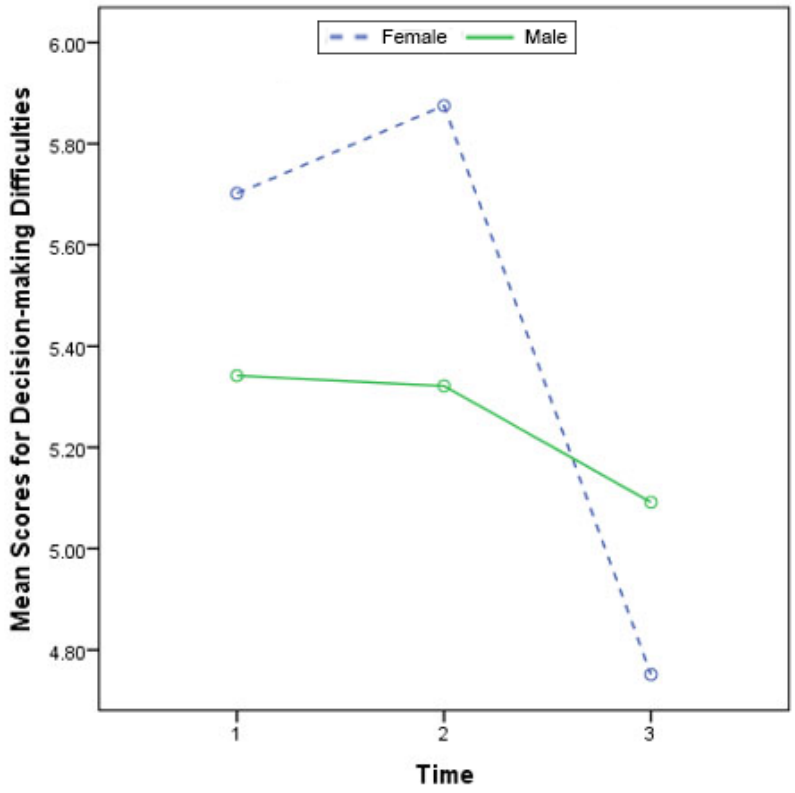


Figure 7.5. Significant interaction effects of time and gender on career decision-making difficulties

7.5 Discussion of findings

One of the principal objectives of the pilot study is that it would permit preliminary testing of hypotheses that the intervention is effective in increasing CDMSE and in reducing career indecision and difficulties. In addition, data from the pilot study would also allow preliminary investigation of the relationship between CDMSE and career indecision; and between CDMSE and career decision-making difficulties. Further, the pilot study would also enable the investigation into gender and career decision-making.

First, it was hypothesised that students will exhibit a significant increase in CDMSE post-intervention. The results show that CDMSE increased significantly along with its four subscales. Thus, this hypothesis was fully supported.

Second, it was hypothesised that students' overall career indecision will be reduced significantly after completing the course. The results show that career indecision decreased significantly post-intervention, thus, this hypothesis was fully supported as well. Third, we hypothesised that students' overall career decision-making difficulties will be reduced significantly post intervention. Although it was found that career decision-making difficulties decreased significantly, the change in one of the three main categories, namely *inconsistent information*, was not significant. Therefore, this hypothesis was partially supported.

Fourth, it was hypothesised that CDMSE would be moderately and negatively correlated with career indecision. At pre-test, career indecision was found to be significantly and negatively correlated with one subscale of the CDSES-SF only namely *goal selection*. However, this correlation was considered weak (Cohen, 1988). At post-test, all correlations between career indecision and CDMSE were not significant. Therefore, this hypothesis was not supported.

Fifth, it was also hypothesised that CDMSE would be moderately and negatively correlated with career decision-making difficulties. The results revealed that at pre-test, the total CDSES-SF and CDDQr were significantly

and moderately correlated. In addition, three of four subscales of the CDSES-SF were also correlated with the main categories of the CDDQr. At post-test, the total instruments were not significantly correlated. However, the total CDSES-SF and two of its subscales were significantly correlated with one main category of difficulty. Thus, this hypothesis was partially supported.

Finally, while no significant gender differences were observed for CDMSE post-intervention, the decrease in career indecision and decision-making difficulties among female students was significant post-intervention. The changes in male students post-intervention were not significant. The findings suggest that the intervention was more effective in reducing career indecision and decision-making difficulties for female students compared to male students. However, the sample of size of 40 cases is considered small so further research with a bigger sample size is necessary to verify this.

In summary, the overall results of the statistical analyses of the data from the pilot study were encouraging and indicated that the intervention was effective in increasing CDMSE and in reducing career indecision and decision-making difficulties. Although the hypotheses regarding relationships among the three constructs were not fully supported, the mixed results from the correlational analyses indicated that further research was necessary. The results regarding gender in interventions were interesting and would be further explored in the main study.

7.6 Feedback on research design process

The findings of the pilot study were also important to the research design process and will be discussed in the following subsections.

7.6.1 Timing and instruments

The pilot study revealed that the time allocated for each session was sufficient. For example, the one-hour slot for the briefing session during the orientation week at college was adequate for the purposes of promoting the course and encouraging students to attend it. It also permitted the testing of the instruments. The two-hour weekly sessions were necessary to complete the activities planned.

Based on the pilot study, it was discovered that students needed on average approximately 20 minutes to complete the MCD questionnaire booklet. As the instruments were not translated, it was important to ascertain if students had difficulties completing the instruments. Students did not encounter problems understanding the instructions on how to complete them or the statements within the MCD. However, upon checking completed MCD questionnaire booklets, some students omitted complete pages and these were subsequently removed from data analyses.

7.6.2 Attrition rate, recruitment and retention strategies

With the support of the two colleges' administrators, it was possible to promote the course to most new students (as not all students attended the orientation programme) at the onset of their course in college and to invite them to participate in the study. Only students who attended the briefing session, completed the consent form and MCD questionnaire booklet were invited to attend the course four weeks later. Although 182 students registered for the course during the briefing session, only 126 students eventually attended the first session four weeks later. At the end of the course, there were only 40 students who completed the course. The attrition rate was considered high as only 31.75% of participants who attended the first lesson completed the course four weeks later. This could be due to students' busy academic schedule and extracurricular activities which commenced after the orientation week and conflicted with the timing of the sessions. Although the sessions for the course were held after official classes had ended for the day, there were still conflicts with extracurricular activities which were held on different days and involved different students. It also appeared that students began missing the sessions once their academic studies and extracurricular activities took more of their time. As the career course was purely voluntary, they could drop out any time they wished.

Therefore, to increase participation for the main study, posters were sent to the colleges to be put up on notice boards on college grounds and permission was sought from college administrators to email students to remind them of the start

of the career course after the briefing session. It was hoped that the endorsement from college administrators would encourage more students to attend the sessions and be committed to come for all four sessions. To reduce the attrition rate over the course of the intervention, two strategies were implemented: (1) an email that summarised key points of the session, and included a preview of the next session, was sent to students after each session; and (2) students were reminded of the importance of attending all four session to benefit fully from the course during the briefing session and during the first three sessions.

7.6.3 Modifications to intervention

The pilot study also provided insights into ways to make the course more interesting for students and effective in meeting course objectives. The following modifications were made to the career course based on feedback from the pilot study:

1) An introduction was added to the course book for students to help them to identify their specific career concerns and to get students to start thinking about careers and courses at the onset of the course. By including this in the course book, students could refer to their specific career concerns as the course progressed to evaluate if these have been addressed in the course.
2) The original activity on skills where students had to write about a project in which they participated that demonstrated certain skill sets was changed to a checklist of skills. This was because students found it

difficult to write about one project in which they could showcase a variety of skills.

3) A case study on problem-solving was added to encourage discussion on the problem-solving process. It was felt that students would be more involved in the topic if they could contribute their thoughts and ideas on it instead of listening to the subject matter being explained in a lecture.

7.6.4 Changes to feedback form

Of the 40 participants who completed the feedback form, only one participant gave the feedback that the course was ‘too long’; nine students reported that it was ‘too short’, while the rest said it was ‘just right’. Fifteen students rated the ‘quality of materials’ as ‘satisfactory’ while 25 rated them as ‘excellent’.

Originally, the feedback form asked students to rate the instructor. Although 24 students rated the instructor as ‘excellent’ (and the rest rated ‘satisfactory’), it was felt that it would be more relevant to the objectives of the study for students to rate the topics covered within the course instead. Therefore, this was changed to ‘topics covered’ in the feedback form in the main study.

Students mentioned a variety of activities which they enjoyed including the personal values card sort activity, the career fantasy, online personality test, Self-Directed Search, identifying work values, career timeline construction, role models, and informational interviews. This provided valuable feedback on

activities that worked for students, and were therefore maintained in the main study.

Although only 20 students reported that they had made a course or career decision after the course, all 40 students reported that the course had helped them in making career decisions.

7.7 Chapter summary and conclusions

The pilot study provided valuable insights into the effectiveness of the course, and the relationships among the three constructs. It also provided important feedback on the research design process. Specifically, the pilot study provided feedback on the timing and instruments; attrition rate, recruitment and retention strategies; the intervention itself and the modifications necessary to improve the activities to better meet the objectives set; and to the feedback form.

The insights and feedback gained were generally encouraging and provided the much needed confidence to carry out the main study.

The next three chapters present the analyses of data for the main study. They seek to answer research questions relating to the impact of the intervention on the three constructs; the relationship between CDMSE and career indecision, and between CDMSE and decision-making difficulties; and the role of gender in interventions.

CHAPTER 8 – IMPACT OF INTERVENTION ON CDMSE, CAREER INDECISION AND DECISION-MAKING DIFFICULTIES

8.1 Chapter overview

This chapter details the statistical and descriptive analyses of data collected for the main study, and are presented according to the instruments and research questions and hypotheses outlined in chapter three. This chapter begins with a brief background and purpose of the present investigation, and continues with the preliminary analyses of data for the main instruments, followed by the analyses and results. It then continues with analyses of data collected by other methods. This chapter addresses the second research question regarding the impact of the intervention on CDMSE, career indecision and career decision-making difficulties.

8.2 The present investigation

Career psychologists and practitioners are often presented with students who are undecided about a course or career. In order to help these students, various interventions have been developed. However, many of these interventions are not based on the latest research and career theory (Reese & Miller, 2006). Theoretically-based and empirically-validated interventions are much needed because they can be adapted for use with different populations, thus saving time and resources (Gainor, 2005). However, few studies have systematically

evaluated the impact and outcomes of career interventions designed to increase CDMSE and to reduce career indecision and decision-making difficulties.

One of the research aims of the present study was to design and develop a career intervention for undecided college students that incorporates the four sources of information proposed by Bandura (1986) through which self-efficacy is modified and the five critical ingredients of a career intervention by Brown and Ryan Krane (2000).

The present investigation examines the effects of this career intervention on CDMSE, career indecision and decision-making difficulties as measured by the three main instruments and other methods. The statistical and descriptive analyses are described below.

8.3 Main instruments

The main instruments for data collection were the Career Decision Self-Efficacy Scale-Short Form (CDSES-SF by Betz et al., 1996), Career Decision Scale (CDS by Osipow et al., 1976), the revised version of the Career Decision Difficulties Questionnaire (CDDQr by Gati & Saka, 2001b). These three instruments were combined into a booklet called Making Career Decisions (MCD).

A total of 739 MCD booklets were given out and were completed at Time 1 (366 for the first cohort and 373 for the second cohort). Of this number of

completed booklets, 47 were excluded from the analyses either because there were too many omissions and not completed properly, or they were completed by international students. Data from international students were excluded from this study. After data cleaning, 692 booklets were analysed (327 from the first cohort and 365 from the second cohort).

8.3.1 Preliminary analyses

8.3.1.1 Use of parametric tests

Although the three instruments used employed Likert-type scales with 4 to 9 points, it was felt that the data could be analysed using parametric tests because of the fairly large sample size (> 100) for each group. Moreover researchers within the area of career decision-making interventions have also employed parametric tests to analyse their data (e.g., Fouad et al., 2009; Grier-Reed & Ganuza, 2011; Reese & Miller, 2006). However, before parametric analyses were carried out, the suitability of the data for parametric analyses was investigated, for example, whether the data to be analysed met the two requirements for parametric analyses, namely normality of distribution and equality of variance (Brace, Snelgar & Kemp, 2012). Z-scores for skew and kurtosis within the cut-off point of ± 3.29 for a sample size of more than 100 cases (Mayer, 2013) was used to assess normality of data, while Levene's test was used to assess equality of variance (Mayer, 2013). Assumptions of normality and equality of variances for each of the instruments are discussed in turn below.

CDSES-SF Data for CDMSE are normally distributed for both groups at both time points with z-scores for skew and kurtosis well within the cut-off point of ±3.29 (Mayer, 2013). There is homogeneity of variances at both time points, as assessed by Levene's test of homogeneity of variance (Time 1 p = .861; Time 4 p = .843).

CDS Data for CDS are normally distributed for both groups at both time points, with z-scores for skew and kurtosis within the cut-off point of ±3.29 (Mayer, 2013). The assumption of homogeneity of variances at Time 1 was violated, as assessed by Levene's test of homogeneity of variance (p = .011). However, there was homogeneity of variance at Time 4 (p = .743).

CDDQr Data for CDDQ are normally distributed for both groups at both time points, with z-scores for skew and kurtosis within the cut-off point of ±3.29 (Mayer, 2013). Assumption of homogeneity of variances at both time points was met, as assessed by Levene's test of homogeneity of variance (Time 1 p = .139; Time 4 p = .743).

Overall, the data are normally distributed and there is equality of variances, except for data on career indecision at Time 1. According to Mayer (2013), if both groups are of equal size (which they are in the present study), 'ANOVA is robust enough to withstand unequal variances' (p. 181). Therefore, a decision was made to proceed with parametric analyses of the data.

8.3.1.2 Equivalence of data from participants

As data were collected from two different cohorts of students from two colleges, it was important to establish equivalence of data from participants for two main reasons. Firstly, if the cohorts of students were equivalent, their data could be combined and analysed together. Secondly, it was important to demonstrate that participants were equivalent before the intervention so that changes in the three constructs as measured by the instruments after the intervention could be attributed to the intervention itself.

The first cohort of students consisted of 327 students, of which 221 were from MCKL while 106 were from Taylor's College. From this figure, only 83 students (57 from MCKL and 26 from Taylor's) completed the intervention and were considered the intervention group. Independent samples t-tests were used to determine if these students from the two colleges were equivalent at Time 1. The results showed that the difference between these two groups was non-significant for all three variables at Time 1 (CDMSE $p = .701$, career indecision $p = .477$, decision-making difficulties $p = .757$). Therefore, data from these two groups were combined and analysed together to form the intervention group for the first cohort.

The second cohort of students consisted of 365 students from MCKL only. Of this figure, only 40 students completed the intervention. Independent samples t-tests were used to determine if the intervention group from the first cohort was equivalent to the intervention group from the second cohort. The results

showed that the difference between these two groups was non-significant for all three variables at Time 1 (CDMSE $p = .750$, career indecision $p = .386$, decision-making difficulties $p = .725$). Therefore, data from students from the two cohorts were combined and analysed together as the intervention group ($n = 123$).

Independent samples t-tests were carried out to determine if students who did not undergo the intervention in the first cohort ($n = 244$) was equivalent to students who did not undergo the intervention in the second cohort ($n = 325$). The results showed that the difference between these two groups was non-significant for all three variables at Time 1 (CDMSE $p = .325$, career indecision $p = .130$, decision-making difficulties $p = .078$). From these two groups, 60 students from the first cohort and 61 students from the second cohort completed the instruments at Time 1 and Time 4, and were considered the comparison group. Independent samples t-tests were carried out to determine if these two groups of students from two different cohorts were equivalent. The results showed that the difference between these two groups was non-significant for all three variables at Time 1 (CDMSE $p = .976$, career indecision $p = .632$, decision-making difficulties $p = .895$). Therefore, data from students from the two cohorts were combined and analysed together as the comparison group ($n = 121$).

Results from independent samples t-tests showed that the intervention and comparison group at Time 1 were equivalent (CDMSE $p = .348$, career indecision $p = .228$, decision-making difficulties $p = .493$).

Further independent samples t-tests were conducted to ascertain if students from the intervention group (n = 83) and other students (n = 244) in the first cohort were equivalent, and results revealed that the difference between these two groups was non-significant for all three variables at Time 1 (CDMSE p = .136, career indecision p = .182, decision-making difficulties p = .391). Similarly, for the second cohort, the difference between students in the intervention group (n = 40) and other students (n = 264) was non-significant for all three variables at Time 1 (CDMSE p = .145, career indecision p = .242, decision-making difficulties p = .079). These results showed that all groups were equivalent at Time 1.

In summary, the intervention group consisted of 123 participants who completed the intervention and returned completed measurement instruments at Times 1, 2 and 3. From this group, only 101 participants completed the follow-up measurement at Time 4. The comparison group consisted of 121 students who completed the measurement instruments at Time 1 and Time 4, but did not undergo or complete the intervention. This group of students was chosen as the comparison group because they provided data for comparison with the intervention group prior to the intervention and after the intervention at the follow-up time point. The intervention group consisted of 45 male students and 78 female students; while the comparison group consisted of 47 male students and 74 female students.

8.3.1.3 Attrition analysis

At the briefing sessions, a total of 324 students registered for the course. However, only 214 students eventually attended the first session and completed the instruments at Time 2. Of this number, only 123 students completed the intervention. As the attrition rate for students was high between Time 2 and Time 3 (42.52%), it was important to investigate if the students who remained on the course (123) were different from those who dropped out of the study (91). Independent samples t-tests showed that those who dropped out did not differ from those who remained on two of three variables: career indecision, t (212) = -.033, p = .973; and career decision-making difficulties, t (211) = -1.63, p = .104. However, those who dropped out had significantly lower mean scores for CDMSE, t (212) = 2.00, p = .047, suggesting that they had lower levels of confidence in carrying out tasks specific to making career decisions. It was unfortunate that they should drop out because the course was designed to help students increase their career decision-making self-efficacy. However, it could also be that because these students had lower self-efficacy in carrying out career decision-making tasks that they dropped out of the course. The implication of this finding will be discussed later.

8.3.1.4 Reliability analyses

The reliabilities of the three instruments for the present sample were examined and presented here. The reliabilities of some of the subscales of the CDSES-SF and CDDQr were lower compared to the main scales (i.e., ranging from .52 to

.69). However, the overall instruments exhibited reliability scores ranging from .81 to .95 indicating that the total scales have high internal reliabilities (Mayer, 2013). Cronbach's alpha for the three instruments and their subscales at four time points are shown in Table 8.1 below.

Table 8.1

Cronbach's alpha for CDS, CDSES-SF and CDDQr and their subscales at four time points

	α			
Instruments	Time 1	Time 2	Time 3	Time 4
CDS	0.85	0.81	0.88	0.89
CDSES-SF				
Occupational information	0.77	0.77	0.78	0.84
Problem-solving	0.61	0.63	0.73	0.73
Goal selection	0.83	0.83	0.85	0.83
Decision-making	0.74	0.73	0.75	0.81
Total CDSES-SF	0.88	0.88	0.91	0.93
CDDQr				
Readiness	0.59	0.68	0.66	0.70
Lack of motivation	0.52	0.58	0.52	0.65
General indecisiveness	0.64	0.77	0.70	0.72
Dysfunction beliefs	0.65	0.64	0.69	0.64
Lack of information	0.93	0.92	0.93	0.95
About the CDM process	0.85	0.87	0.88	0.92
About the self	0.86	0.82	0.83	0.89
About occupations	0.82	0.81	0.83	0.86
About obtaining additional information	0.67	0.54	0.71	0.78
Inconsistent information	0.80	0.81	0.86	0.91
Unreliable information	0.63	0.63	0.76	0.8
Internal conflicts	0.71	0.68	0.75	0.85
External conflicts	0.72	0.74	0.75	0.76
Total CDDQr	0.92	0.92	0.93	0.95

8.4 Research question two - How does participation in this career course affect students' CDMSE, career indecision, and career decision-making difficulties?

In order to answer the above research question, data were analysed using the following methods: Firstly, a mixed multifactorial Analysis of Variance (mixed ANOVA) was used to explore within-group and between-group main effects and to examine interactions between them (Mayer, 2013). A mixed ANOVA was chosen in order to determine whether there was an interaction between two independent variables (one of which was a within-group variable and the other was a between-group variable) on the dependent variables (Mayer, 2013). In the present study, the within-group variable is time (pre- and post-intervention), and the between-group variable is group (intervention and comparison). The dependent variables are the three constructs being measured, namely CDMSE, career indecision, and decision-making difficulties. Data from Time 1 and Time 4 are considered in the analyses for the intervention and comparison groups because data from the comparison group were obtained for these two time points only.

Secondly, a repeated measures ANOVA was carried out to determine whether there were statistically significant differences in the three constructs over the four time points among participants in the intervention group only. A repeated measures ANOVA was chosen because the same participants underwent both conditions (with and without intervention) and were measured at four different time points. The results of the analyses will enable comparisons of the mean

scores for the three constructs in both conditions. The independent variable or within-subject factor is time (four time points), and the dependent variables are the three constructs. The impact of the intervention on the three constructs will be discussed in turn below.

8.4.1 Impact of intervention on CDMSE

8.4.1.1 Testing of assumptions for mixed ANOVA

In order for the results of statistical analyses to be interpreted with confidence, the following assumptions need to be met for mixed ANOVAs (which include univariate and repeated-measures analysis): normality of data, equality of covariance, sphericity, and homogeneity of variances (Mayer, 2013). As mentioned in section 8.3.1.1, data are normally distributed. Box's *M* test of equality of covariance matrices was statistically significant ($p = .001$) which means that the assumption of homogeneity of covariance matrices was violated. However, according to Tabachnick and Fidell (2014), if sample sizes are equal for both groups, Box's *M* test can be disregarded and the robustness of significance tests is expected. Mauchly's test of sphericity can also be ignored as there are only two conditions (with and without intervention), and sphericity can be assumed (Mayer, 2013). For tests with more than two conditions or two time points, Maxwell and Delaney (2004) suggest ignoring the results of the Mauchly's test of sphericity and using the Greenhouse-Geisser correction instead. In the present study, where applicable, the Greenhouse-Geisser correction was used if the results of the Mauchly's test of

sphericity was significant. There was homogeneity of variances, as assessed by Levene's test of equality of error variances (Time 1, $p = .714$; Time 4, $p = .843$). The Bonferroni adjustment was used for testing all possible pairwise combinations of levels of the within-subject factor as it is most suitable for making post-hoc comparisons following the suggestion by Maxwell and Delaney (2004). The results are presented below.

8.4.1.2 Results for mixed ANOVA for interaction effects of time and group on CDMSE for intervention and comparison groups at Time 1 and Time 4

There was a statistically significant interaction between group and time on CDMSE as measured by the total CDSES-SF scale, F (1,220) = 59.79, $p < .001$, partial $\eta^2 = .21$. As there was statistically significant interaction, separate between-subject ANOVAs were carried out to test for differences between groups at the two time points. The results indicate that at Time 1, the difference in CDMSE scores between intervention and comparison groups was non-significant ($p = .348$), but at Time 4, there was a statistically significant difference in CDMSE between the two groups, $F(1, 220) = 41.17$, $p < .001$, partial $\eta^2 = .16$. Further separate within-subject ANOVAs were carried out to test for differences in CDMSE between the two time points for each group. The results indicate that for the comparison group, the change in CDMSE over time was non-significant ($p = .062$). For the intervention group on the other hand, CDMSE increased significantly over time $F(1, 100) = 58.86$, $p < .001$, partial

η² = .37. Figure 8.1 depicts the interaction effects of group and time on CDMSE.

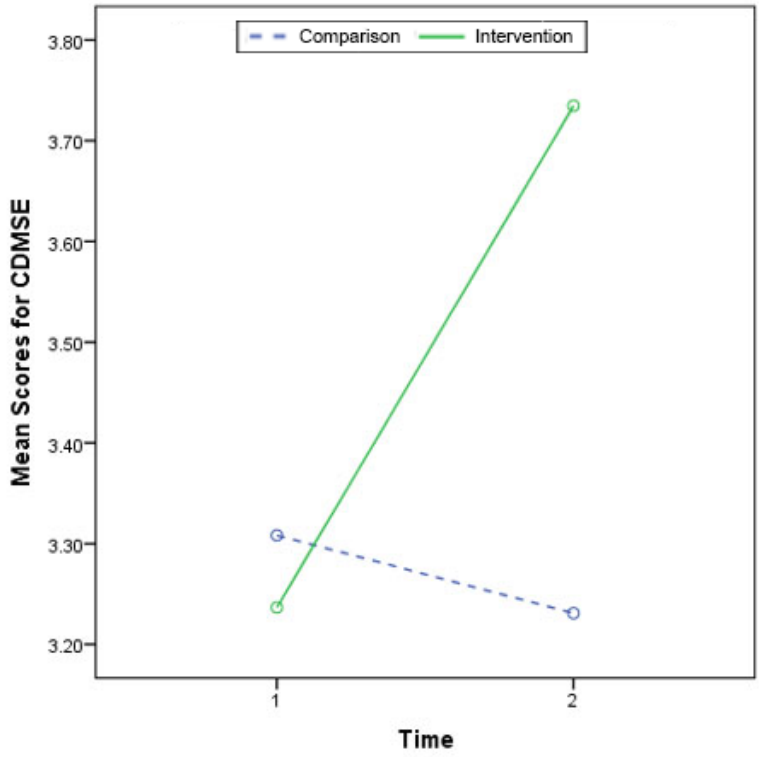


Figure 8.1. Significant Interaction Effect of Group and Time on Career Decision-Making Self-Efficacy

8.4.1.3 Results for mixed ANOVA for interaction effects of time and group on the four subscales of the CDSES-SF for intervention and comparison groups at Time 1 and Time 4

There were statistically significant interactions between group and time on the four subscales as well:

(1) *occupational information, F* (1, 220) = 51.29, $p < .001$, partial η² = .19. At Time 1, the difference in scores for *occupational information* between intervention and comparison groups was non-significant, $p = .307$. However, at

Time 4, there was a statistically significant difference in the scores for this subscale between the two groups, F (1, 220) = 35.89, $p < .001$, partial $\eta^2 = .14$. For the comparison group, the decrease in *occupational information* over the two time points was significant F (1, 120) = 18.30, $p < .001$, partial $\eta^2 = .13$. The increase in *occupational information* for the intervention group over time was also significant, F (1, 100) = 30.78, $p < .001$, partial $\eta^2 = .24$.

(2) *problem-solving, F* (1, 220) = 29.52, p < .001, partial $\eta^2 = .12$. At Time 1, the difference in the subscale scores between intervention and comparison groups was non-significant, $p = .579$. However, at Time 4, there was a statistically significant difference in the scores for this subscale between the two groups, F (1, 220) = 29.70, $p < .001$, partial $\eta^2 = .12$. For the comparison group, the change in *problem-solving* over the two time points was non-significant, $p < .941$, while the increase in *problem-solving* for the intervention group over time was significant, F (1, 100) = 41.13, $p < .001$, partial $\eta^2 = .29$.

(3) *goal selection, F* (1, 220) = 31.85, $p < .001$, partial $\eta^2 = .13$. At Time 1, the difference in scores between intervention and comparison groups was non-significant, $p = .172$. However, at Time 4, there was a statistically significant difference in the scores for this subscale between the two groups, F (1, 220) = 21.87, $p < .001$, partial $\eta^2 = .09$. For the comparison group, the change in *goal selection* over the two time points was non-significant, $p = .567$, while the increase in *goal selection* for the intervention group over time was significant, F (1, 100) = 47.97, $p < .001$, partial $\eta^2 = .32$.

(4) *decision-making, F* (1, 220) = 22.99, $p < .001$, partial $\eta^2 = .10$. At Time 1, the difference in scores between intervention and comparison groups was non-significant, $p = .545$. However, at Time 4, there was a statistically significant

difference in the scores for this subscale between the two groups, F (1, 220) = 29.50, $p < .001$, partial $\eta^2 = .12$. For the comparison group, the change in *decision-making* over the two time points was non-significant, $p = .205$, while the increase in *decision-making* for the intervention group over time was significant, F (1, 100) = 25.11, $p < .001$, partial $\eta^2 = .20$. Figure 8.2 depicts the interaction effects of group and time on the four subscales.

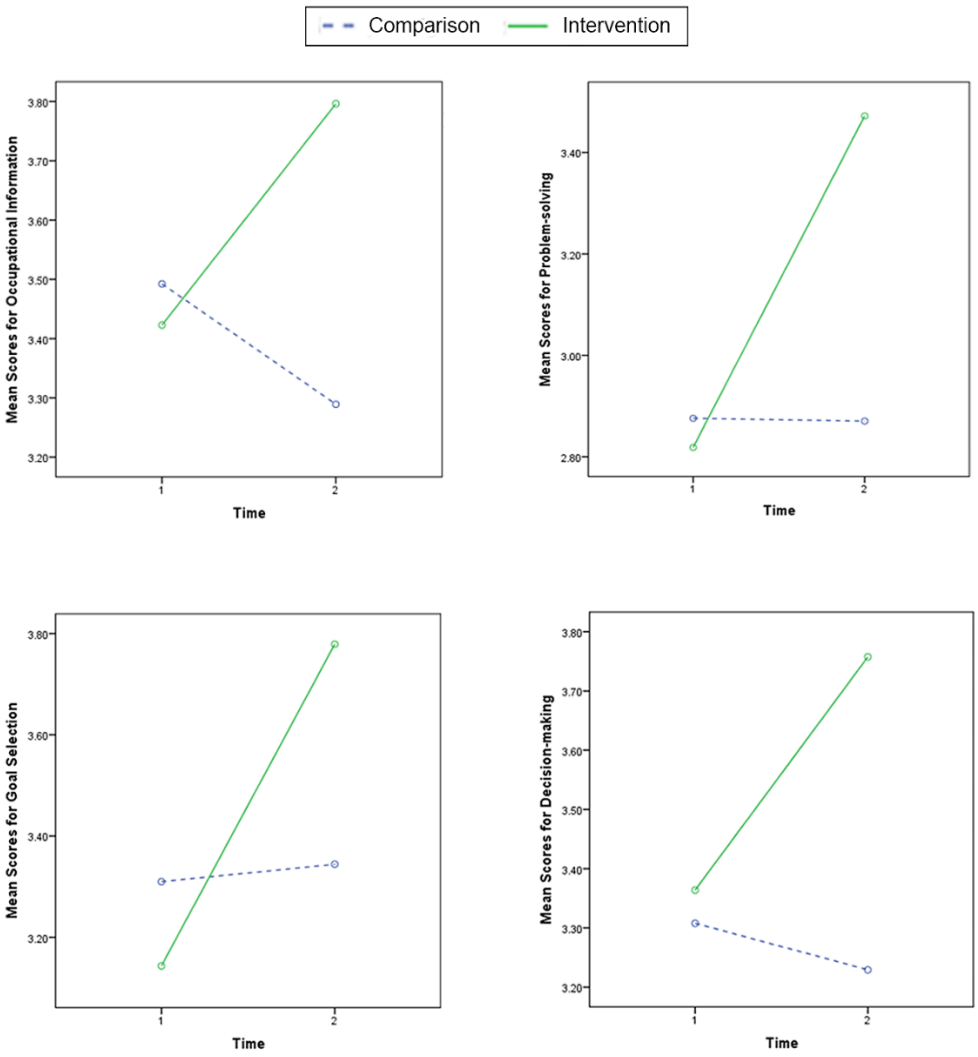


Figure 8.2. Significant Interaction Effect of Group and Time on the four subscales of the CDSES-SF

In summary, the intervention group showed significantly larger gains in the total scale and the four subscales compared to the comparison group. The effect size was the largest for *goal selection* compared to the other subscales with *decision-making* recording the smallest effect size. Table 8.2 displays the pre-test and post-test scores for CDSES-SF total and subscale scores for the intervention and comparison groups, and interaction effects.

Table 8.2

Pre-test and Post-test Scores for the Intervention and Comparison groups on the CDSES-SF and four subscales

		Intervention		**Comparison**				
CDSES- SF		M	SD	M	SD	*F*	*p*	partial η²
Occupational information	Pre	3.42	0.60	3.49	0.68	51.29	.000	.19
	Post	3.80	0.58	3.29	0.66			
Problem-solving	Pre	2.82	0.82	2.88	0.77	28.52	.000	.12
	Post	3.47	0.89	2.87	0.75			
Goal Selection	Pre	3.14	0.86	3.31	0.77	31.85	.000	.13
	Post	3.77	0.67	3.34	0.71			
Decision-making	Pre	3.36	0.69	3.22	0.77	22.99	.000	.10
	Post	3.76	0.62	3.06	0.69			
Total CDSES-SF	Pre	3.24	0.56	3.31	0.58	59.79	.000	.21
	Post	3.73	0.57	3.23	0.59			

Note: Interaction effects (Group x Time) are reported

8.4.1.4 Results for repeated measures ANOVA for CDMSE over time for the intervention group only

The assumption of sphericity was violated, as assessed by Mauchly's test of sphericity, $p < .001$. Therefore, a Greenhouse-Geisser correction was applied ($\varepsilon = 0.85$) to correct the one-way repeated measures ANOVA (Maxwell & Delaney, 2004).

CDMSE was significantly different at different time points, F (2.55, 255.11) = 69.98, $p < .001$, partial $\eta^2 = .41$. Post-hoc analysis with a Bonferroni adjustment (Maxwell & Delaney, 2004) revealed that there was a significant decrease in CDMSE before intervention from Time 1 (M = 3.24, SD = .56) to Time 2 (M = 3.07, SD = .51), a mean difference of .16, 95% CI (0.04, 0.29), p = .003. However, CDMSE increased significantly post-intervention from Time 2 to Time 3 (M = 3.71, SD = .54), a mean difference of .64, 95% CI (0.49, 0.78), $p < .001$. Although there was a slight increase in CDMSE from Time 3 to Time 4 (M = 3.73, SD = .57), the increase was non-significant (p = 1.00). Figure 8.3 shows the means scores for CDMSE at the four time points.

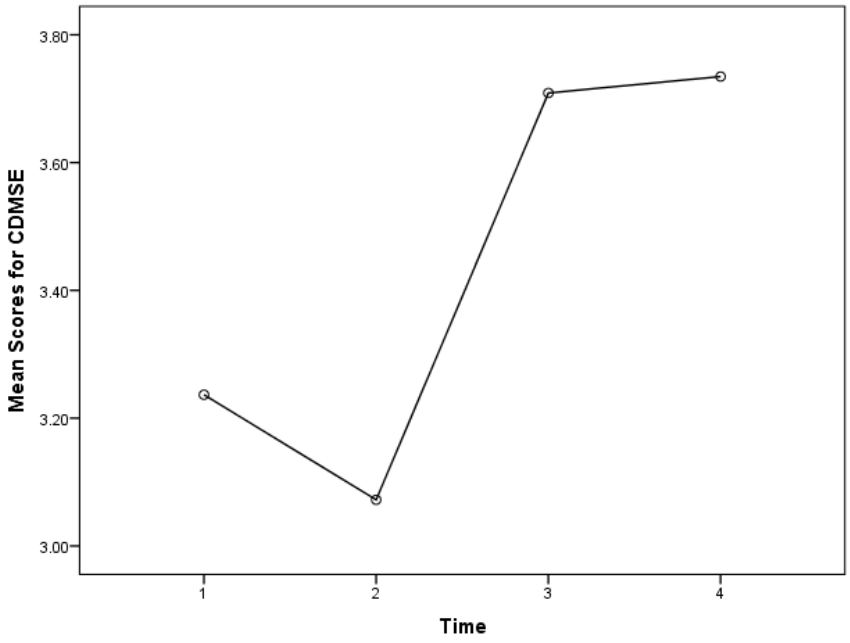


Figure 8.3. Mean Scores for Career Decision-Making Self-Efficacy at the four time points

8.4.1.5 Results for repeated measures ANOVA for the four subscales of the CDSES-SF over time for the intervention group only

Repeated measures ANOVA was also carried out for the four subscales of the CDSES-SF. The results for each subscale are presented below.

1) Occupational information

The assumption of sphericity was violated, as assessed by Mauchly's test of sphericity, $p < .001$. Therefore, a Greenhouse-Geisser correction was applied ($\varepsilon = 0.86$) to correct the one-way repeated measures ANOVA (Maxwell & Delaney, 2004). Scores for *occupational information* was significantly different at different time points, F (2.57, 256.67) = 36.20, $p < .001$, partial $\eta^2 = .27$. Post-hoc analysis with a Bonferroni correction revealed that there was a significant decrease in *occupational information* before intervention from Time 1 (M = 3.42, SD = .60) to Time 2 (M = 3.29, SD = .61, a mean difference of .14, 95% CI [0.00, 0.27], p = .046). However, *occupational information* increased significantly post-intervention from Time 2 to Time 3 (M = 3.82, SD = .57), a mean difference of .53, 95% CI (0.36, 0.70), $p < .001$. Although there was a slight decrease in *occupational information* from Time 3 to Time 4 (M = 3.80, SD = .58), the decrease was non-significant (p = 1.00).

2) Problem-solving

The assumption of sphericity was violated, as assessed by Mauchly's test of sphericity, $p < .001$. Therefore, a Greenhouse-Geisser correction was applied ($\varepsilon = 0.86$) to correct the one-way repeated measures ANOVA (Maxwell & Delaney, 2004). Scores for *problem-solving* was significantly different at different time points, F (2.59, 258.51) = 36.95, $p < .001$, partial $\eta^2 = .27$. Post-hoc analysis with a Bonferroni correction revealed that the slight decrease from

Time 1 (*M* = 2.81, SD = .83) to Time 2 (*M* = 2.65, SD = .79 was non-significant (*p* = .125). However, *problem-solving* increased significantly post-intervention from Time 2 to Time 3 (*M* = 3.34, SD = .88), a mean difference of .69, 95% CI (0.43, 0.96), *p* < .001. Although there was a slight increase in *problem-solving* from Time 3 to Time 4 (*M* = 3.47, SD = .89), the increase was non-significant (*p* = .740).

3) Goal selection

The assumption of sphericity was violated, as assessed by Mauchly's test of sphericity, *p* < .001. Therefore, a Greenhouse-Geisser correction was applied (ε = 0.82) to correct the one-way repeated measures ANOVA (Maxwell & Delaney, 2004). Scores for goal selection was significantly different at different time points, *F* (2.47, 246.46) = 58.03, *p* < .001, partial ŋ² = .37. Post-hoc analysis with a Bonferroni correction revealed that the decrease from Time 1 (*M* = 3.14, SD = .87) to Time 2 (*M* = 2.97, SD = .77) was non-significant (*p* = .061). However, *goal selection* increased significantly post-intervention from Time 2 to Time 3 (*M* = 3.76, SD = .69), a mean difference of .79, 95% CI (0.60, 0.99), *p* < .001. Although there was a slight increase in *goal selection* from Time 3 to Time 4 (*M* = 3.78, SD = .67), the increase was non-significant (*p* = 1.00).

4) Decision-making

The assumption of sphericity was violated, as assessed by Mauchly's test of sphericity, *p* < .001. Therefore, a Greenhouse-Geisser correction was applied (ε = 0.87) to correct the one-way repeated measures ANOVA (Maxwell &

Delaney, 2004). Scores for decision-making were significantly different at different time points, F (2.62, 261.61) = 29.85, $p < .001$, partial $\eta^2 = .23$. Post-hoc analysis with a Bonferroni adjustment revealed that there was a significant decrease from Time 1 (M = 3.36, SD = .77) to Time 2 (M = 3.17, SD = .54), a mean difference of .19, 95% CI [0.02, 0.36], p = .018). However, *decision-making* increased significantly post-intervention from Time 2 to Time 3 (M = 3.71, SD = .67), a mean difference of .54, 95% CI (0.34, 0.74), $p < .001$. Although there was a slight increase in *decision-making* from Time 3 to Time 4 (M = 3.76, SD = .69), the increase was non-significant (p = 1.00). Figure 8.4 shows the means scores for the four subscales of the CDSES-SF at the four time points.

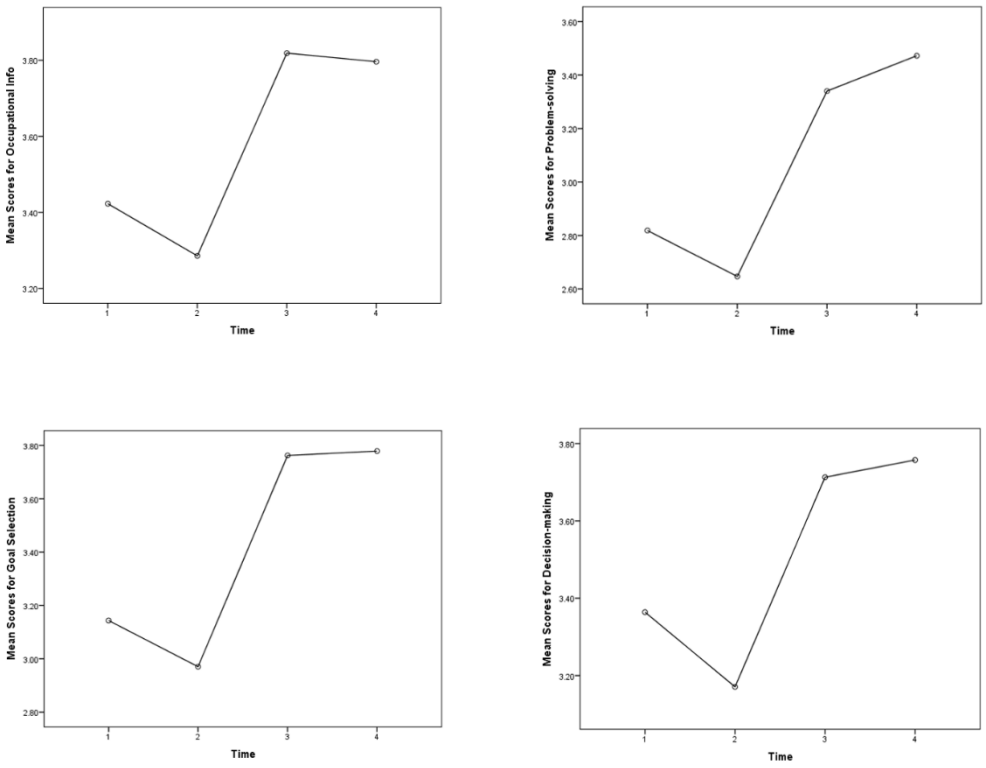


Figure 8.4. Mean Scores for the four subscales of the CDSES-SF at the four time points

In summary, in the period before the intervention, scores on the two of the four subscales decreased significantly from Time 1 to Time 2. From Time 2 to Time 3 when the intervention took place, there were significant increases in the scores for the four subscales, with goal selection recording the largest effect size. The scores for the four subscales did not change significantly at follow-up four weeks later.

8.4.2 Impact of intervention on career indecision

8.4.2.1 Testing of assumptions for mixed ANOVA

Box's *M* test of equality of covariance matrices was non-significant ($p = .117$) which means that the assumption of homogeneity of covariance was met. Mauchly's test of sphericity can be ignored as there are only two conditions (with and without intervention), and sphericity can be assumed (Mayer, 2013). The assumption of homogeneity of variances, as assessed by Levene's test of equality of error variances was violated for Time 1 ($p = .028$) while this assumption was met for data on Time 4 ($p = .900$). However, the decision was made to run the mixed ANOVA anyway because ANOVA is robust enough to withstand unequal variances if both groups are of equal size (Mayer, 2013). The results are presented below.

8.4.2.2 Results for mixed ANOVA for interaction effects between group and time on career indecision for intervention and comparison groups for Time 1 and Time 4

There was a statistically significant interaction between group and time on career indecision as measured by the CDS scale, F (1,220) = 28.11, $p < .001$, partial $\eta^2 = .11$. As there was statistically significant interaction, separate between-subject ANOVAs were carried out to test for differences between groups at the two time points. The results indicate that at Time 1, the difference in CDS scores between intervention and comparison groups was non-significant ($p = .227$), but at Time 4, there was a statistically significant difference in career indecision between the two groups, $F(1, 220) = 11.81$, $p = .001$, partial $\eta^2 = .05$. Further separate within-subject ANOVAs were carried out to test for differences in career indecision between the two time points for each group. The results indicate that for the comparison group, the change in career indecision over time was non-significant ($p = .416$) For the intervention group, on the other hand, career indecision decreased significantly over time $F(1, 100) = 54.14$, $p < .001$, partial $\eta^2 = .35$. Figure 8.5 depicts the interaction effects of group and time on CDMSE.

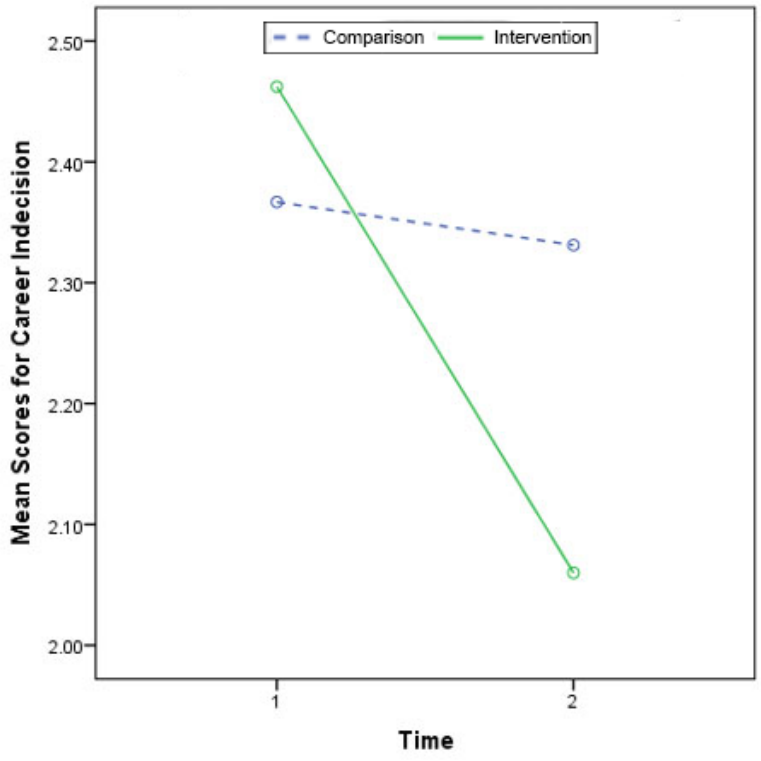


Figure 8.5. Significant Interaction Effect of Group and Time on Career Indecision

8.4.2.3 Results for repeated measures ANOVA for career indecision over time for the intervention group only

The assumption of sphericity was violated, as assessed by Mauchly's test of sphericity, $p < .001$. Therefore, a Greenhouse-Geisser correction was applied ($\varepsilon = 0.83$) to correct the one-way repeated measures ANOVA (Maxwell & Delaney, 2004). Scores for career indecision were significantly different at different time points, F (2.50, 249.50) = 30.61, $p < .001$, partial $\eta^2 = .23$. Post-hoc analysis with a Bonferroni adjustment revealed that the slight decrease in career indecision from Time 1 (M = 2.46, SD = .50) to Time 2 (M = 2.45, SD = .50) was non-significant, p = 1.00). However, career indecision decreased significantly post-intervention from Time 2 to Time 3 (M = 2.16, SD = .59), a

mean difference of .29, 95% CI (0.14, 0.44), $p < .001$. Although there was a further decrease in career indecision from Time 3 to Time 4 ($M = 2.06$, SD = .58), the decrease was non-significant ($p = .499$). Figure 8.6 depicts the mean scores for career indecision at the four time points.

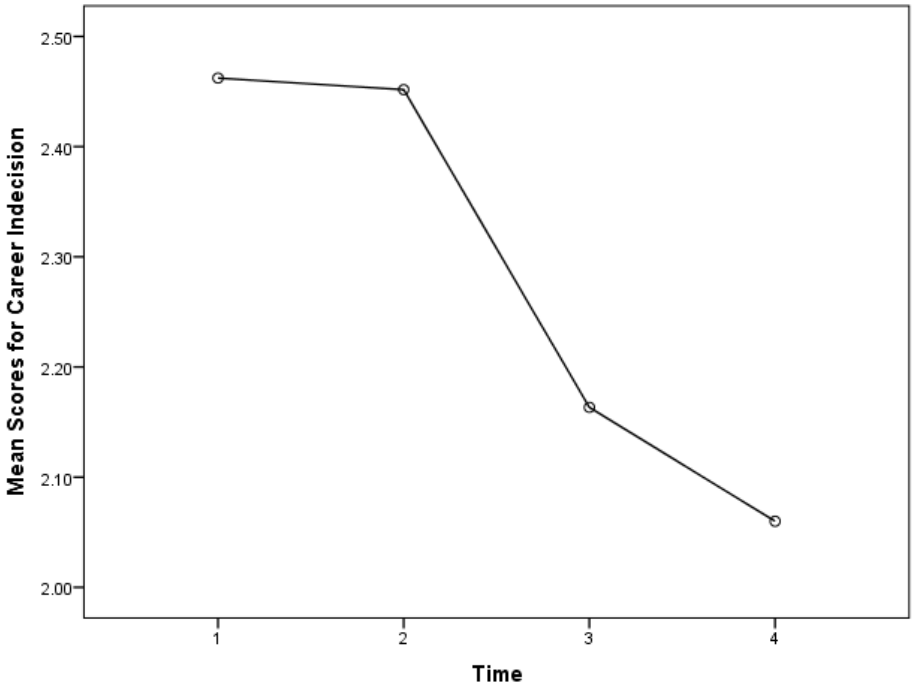


Figure 8.6. Mean scores for Career Indecision at different time points

8.4.3 Impact of intervention on career decision-making difficulties

8.4.3.1 Testing of assumptions for mixed ANOVA

Box's *M* test of equality of covariance matrices was significant ($p = .042$) which means that the assumption of homogeneity of covariance was violated. However, according to Tabachnick and Fidell (2014), if sample sizes are equal

for both groups, Box's *M* test can be disregarded and the robustness of significance tests is expected. Mauchly's test of sphericity can be ignored as there are only two conditions (with and without intervention), and sphericity can be assumed (Mayer, 2013). There was homogeneity of variances, as assessed by Levene's test of equality of error variances (Time 1, $p = .098$; Time 4, $p = .743$). The results are presented below.

8.4.3.2 Results for mixed ANOVA for interaction effect between group and time on decision-making difficulties for intervention and comparison groups for Time 1 and Time 4

There was a statistically significant interaction between group and time on career decision-making difficulties as measured by the total CDDQr scale, $F(1,220) = 47.62$, $p < .001$, partial $\eta^2 = .18$. As there was statistically significant interaction, separate between-subject ANOVAs were carried out to test for differences between groups at the two time points. The results indicate that at Time 1, the difference in career decision-making difficulties scores between intervention and comparison groups was non-significant ($p = .493$), but at Time 4, there was a statistically significant difference in decision-making difficulties between the two groups, $F(1, 220) = 24.95$, $p < .001$, partial $\eta^2 = .10$. Further separate within-subject ANOVAs were carried out to test for differences in decision-making difficulties between the two time points for each group. The results indicate that for the comparison group, the change in decision-making difficulties over time was non-significant ($p = .597$). For the intervention group on the other hand, decision-making difficulties decreased significantly over

time $F(1, 100) = 77.44$, $p < .001$, partial $\eta^2 = .44$. Figure 8.7 depicts the interaction effects of group and time on decision-making difficulties.

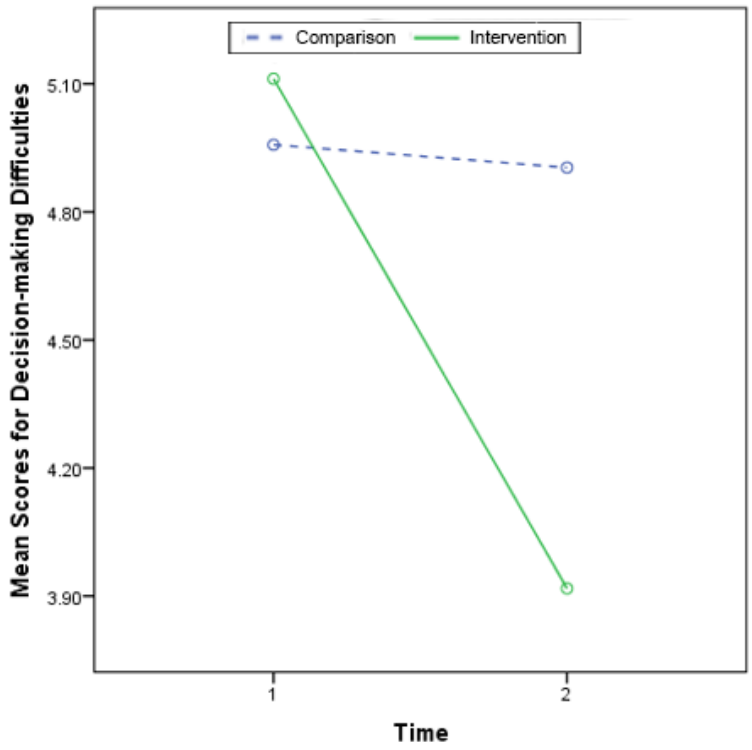


Figure 8.7. Significant Interaction Effect of Group and Time on Career Decision-Making Difficulties

8.4.3.3 Results for mixed ANOVA for interaction effect between group and time on main categories of decision-making difficulties for intervention and comparison groups for Time 1 and Time 4

There were statistically significant interactions between group and time on the three main categories:

(1) *Readiness, F* (1, 220) = 21.69, $p < .001$, partial $\eta^2 = .09$. At Time 1, the difference in scores for the *readiness* category between intervention and

comparison groups was non-significant, $p = .608$. However, at Time 4, there was a statistically significant difference in the scores for this category between the two groups, F (1, 220) = 15.51, $p < .001$, partial $\eta^2 = .07$. For the comparison group, the change in *readiness* over the two time points was non-significant ($p = .572$). For the intervention group on the other hand, the decrease in difficulties related to the lack of *readiness* over time was statistically significant, F (1, 100) = 30.94, $p < .001$, partial $\eta^2 = .24$.

(2) *Lack of information, F* (1, 220) = 31.13, $p < .001$, partial $\eta^2 = .12$. At Time 1, the difference in scores for the *lack of information* category between intervention and comparison groups was non-significant, $p = .825$. However, at Time 4, there was a statistically significant difference in the scores for this category between the two groups, F (1, 220) = 26.93, $p < .001$, partial $\eta^2 = .11$. For the comparison group, the decrease in *lack of information* over the two time points was non-significant ($p = .054$). For the intervention group on the other hand, the decrease in difficulties related to the *lack of information* over time was statistically significant, F (1, 100) = 66.78, $p < .001$, partial $\eta^2 = .40$.

(3) *Inconsistent information, F* (1, 220) = 38.97, $p < .001$, partial $\eta^2 = .10$. At Time 1, the difference in scores for the *inconsistent information* category between intervention and comparison groups was non-significant, $p = .249$. However, at Time 4, there was a statistically significant difference in the scores for this category between the two groups, F (1, 220) = 15.575 $p < .001$, partial $\eta^2 = .07$. For the comparison group, the change in *inconsistent information* over the two time points was non-significant ($p = .323$). For the intervention group

on the other hand, the decrease in difficulties related to *inconsistent information* over time was statistically significant, F (1, 100) = 48.36, p < .001, partial η^2 = .33. Figure 8.8 depicts the interaction effects of group and time on the three main categories of decision-making difficulties.

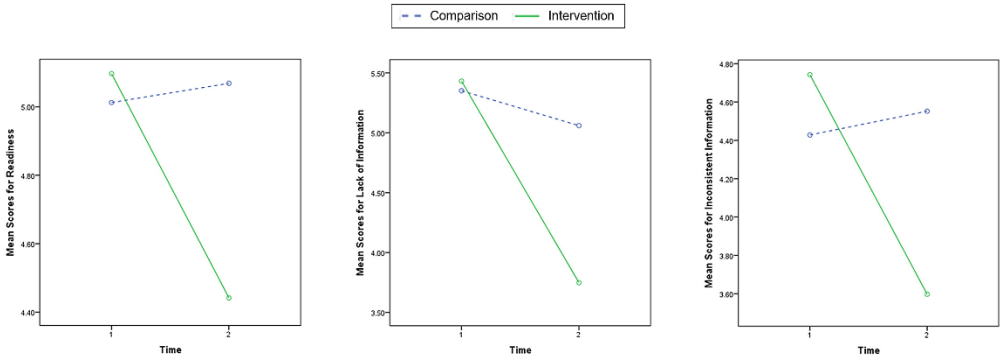


Figure 8.8. Significant Interaction Effects of Group and Time on the three main categories of difficulties

8.4.3.4 Results for mixed ANOVA for interaction effect between group and time on subcategories of decision-making difficulties for intervention and comparison groups for Time 1 and Time 4

Statistically significant interactions were also found between group and time on the 10 sub-categories of difficulties:

(1) *Lack of motivation, F* (1, 220) = 12.56, p < .001, partial η^2 = .05. At Time 1, the difference in scores for the *motivation* sub-category between intervention and comparison groups was non-significant, p = .592. However, at Time 4,

there was a statistically significant difference in the scores for this category between the two groups, F (1, 220) = 16.23 $p < .001$, partial $\eta^2 = .07$. For the comparison group, difficulties related to *motivation* increased significantly over the two time points, $F(1, 120) = 14.48$, $p < .001$. On the other hand, for the intervention group, the decrease in difficulties related to the lack of motivation over time was non-significant, $p = .193$.

(2) *General indecisiveness, F* (1, 220) = 4.04, $p < .046$, partial $\eta^2 = .02$. At Time 1, the difference in scores for the *inconsistent information* category between intervention and comparison groups was non-significant, $p = .416$. However, at Time 4, there was a statistically significant difference in the scores for this category between the two groups, F (1, 220) = 5.38, $p = .021$, partial $\eta^2 = .02$. For the comparison group, difficulties related to general indecisiveness decreased significantly over the two time points, $F(1, 120) = 5.96$, $p = .016$, partial $\eta^2 = .05$. Similarly, the decrease in difficulties related to the lack of motivation over time for the intervention group was also significant, $F(1, 100) = 21.17$, $p < .001$, partial $\eta^2 = .18$.

(3) *Dysfunctional beliefs, F* (1, 220) = 11.48, $p = .001$, partial $\eta^2 = .05$. At both time points, the difference in scores for difficulties related to the *dysfunctional beliefs* subcategory between intervention and comparison groups was non-significant (Time 1, $p = .054$; Time 4, $p = .053$). For the comparison group, the change in difficulties related to *dysfunctional beliefs* over the two time points was non-significant, $p = .590$. However, the decrease in difficulties related to

the *dysfunctional beliefs* for the intervention group over time was statistically significant, $F(1, 100) = 20.07$, $p < .001$, partial $\eta^2 = .17$.

(4) *Lack of information about the career decision-making (CDM) process, F* (1, 220) = 28.49, $p < .046$, partial $\eta^2 = .12$. At Time 1, the difference in scores for this category between intervention and comparison groups was non-significant, $p = .961$. However, at Time 4, there was a statistically significant difference in the scores for this category between the two groups, F (1, 220) = 31.42, $p < .001$, partial $\eta^2 = .13$. For the comparison group, difficulties related to *lack of information about the CDM process* decreased slightly over the two time points, but the change was non-significant, $p = .061$. However, the decrease in difficulties related to the *lack of information about the CDM process* over time for the intervention group was significant, F (1, 100) = 71.93, $p < .001$, partial $\eta^2 = .42$.

(5) *Lack of information about self, F* (1, 220) = 29.01, $p < .001$, partial $\eta^2 = .12$. At Time 1, the difference in scores for the *lack of information about self* category between intervention and comparison groups was non-significant, $p = .668$. However, at Time 4, there was a statistically significant difference in the scores for this category between the two groups, F (1, 220) = 22.30, $p = .001$, partial $\eta^2 = .09$. For the comparison group, difficulties related to l*ack of information about self* decreased significantly over the two time points, F (1, 120) = 4.84, $p = .030$, partial $\eta^2 = .04$. Similarly, the decrease in difficulties related to the *lack of information about self* over time for the intervention group was also significant, F (1, 100) = 66.79, $p < .001$, partial $\eta^2 = .40$.

(6) *Lack of information about occupations, F* (1, 220) = 12.94, $p < .001$, partial $\eta^2 = .06$. At Time 1, the difference in scores for this category between intervention and comparison groups was non-significant, $p = .898$. However, at Time 4, there was a statistically significant difference in the scores for this category between the two groups, F (1, 220) = 15.88, $p < .001$, partial $\eta^2 = .07$. For the comparison group, difficulties related to *lack of information about occupations* decreased slightly over the two time points, but the change was non-significant, $p = .344$. However, the decrease in difficulties related to the *lack of information about occupations* over time for the intervention group was significant, F (1, 100) = 25.15, $p < .001$, partial $\eta^2 = .20$.

(7) *Lack of information about ways of obtaining additional information, F* (1, 220) = 17.18, $p < .001$, partial $\eta^2 = .07$. At Time 1, the difference in scores for this category between intervention and comparison groups was non-significant, $p = .683$. However, at Time 4, there was a statistically significant difference in the scores for this category between the two groups, F (1, 220) = 17.85, $p < .001$, partial $\eta^2 = .08$. For the comparison group, difficulties related to *lack of information about ways of obtaining additional information* decreased slightly over the two time points, but the change was non-significant, $p = .296$. However, the decrease in difficulties related to the *lack of information about ways of obtaining additional information* over time for the intervention group was significant, F (1, 100) = 34.68, $p < .001$, partial $\eta^2 = .26$.

(8) *Unreliable information, F* (1, 220) = 26.57, $p < .001$, partial $\eta^2 = .11$. At Time 1, the difference in scores for this category between intervention and

comparison groups was non-significant, $p = .488$. However, at Time 4, there was a statistically significant difference in the scores for this category between the two groups, F (1, 220) = 21.75, $p < .001$, partial $\eta^2 = .09$. For the comparison group, difficulties related to *unreliable information* increased slightly over the two time points, but the change was non-significant, $p = .452$. However, the decrease in difficulties related to the *unreliable information* over time for the intervention group was significant, F (1, 100) = 35.16, $p < .001$, partial $\eta^2 = .26$.

(9) *Internal conflicts*, F (1, 220) = 22.15, $p < .001$, partial $\eta^2 = .09$. At Time 1, the difference in scores for this category between intervention and comparison groups was non-significant, $p = .508$. However, at Time 4, there was a statistically significant difference in the scores for this category between the two groups, F (1, 220) = 11.62, $p < .001$, partial $\eta^2 = .05$. For the comparison group, difficulties related to *internal conflicts* increased slightly over the two time points, but the change was non-significant, $p = .487$. However, the decrease in difficulties related to the *internal conflicts* over time for the intervention group was significant, F (1, 100) = 29.05, $p < .001$, partial $\eta^2 = .23$.

(10) *External conflicts*, F (1, 220) = 20.41, $p < .001$, partial $\eta^2 = .09$. At Time 1, the difference in scores for this category between intervention and comparison groups was non-significant, $p = .094$. However, at Time 4, there was a statistically significant difference in the scores for this category between the two groups, F (1, 220) = 5.74, $p = .017$, partial $\eta^2 = .03$. For the comparison

group, difficulties related to *external conflicts* increased slightly over the two time points, but the change was non-significant, $p = .407$. However, the decrease in difficulties related to the *external conflicts* over time for the intervention group was significant, $F\ (1, 100) = 24.54$, $p < .001$, partial $\eta^2 = .20$.

Figure 8.9 depicts the interaction effects of group and time on the 10 subcategories of decision-making difficulties.

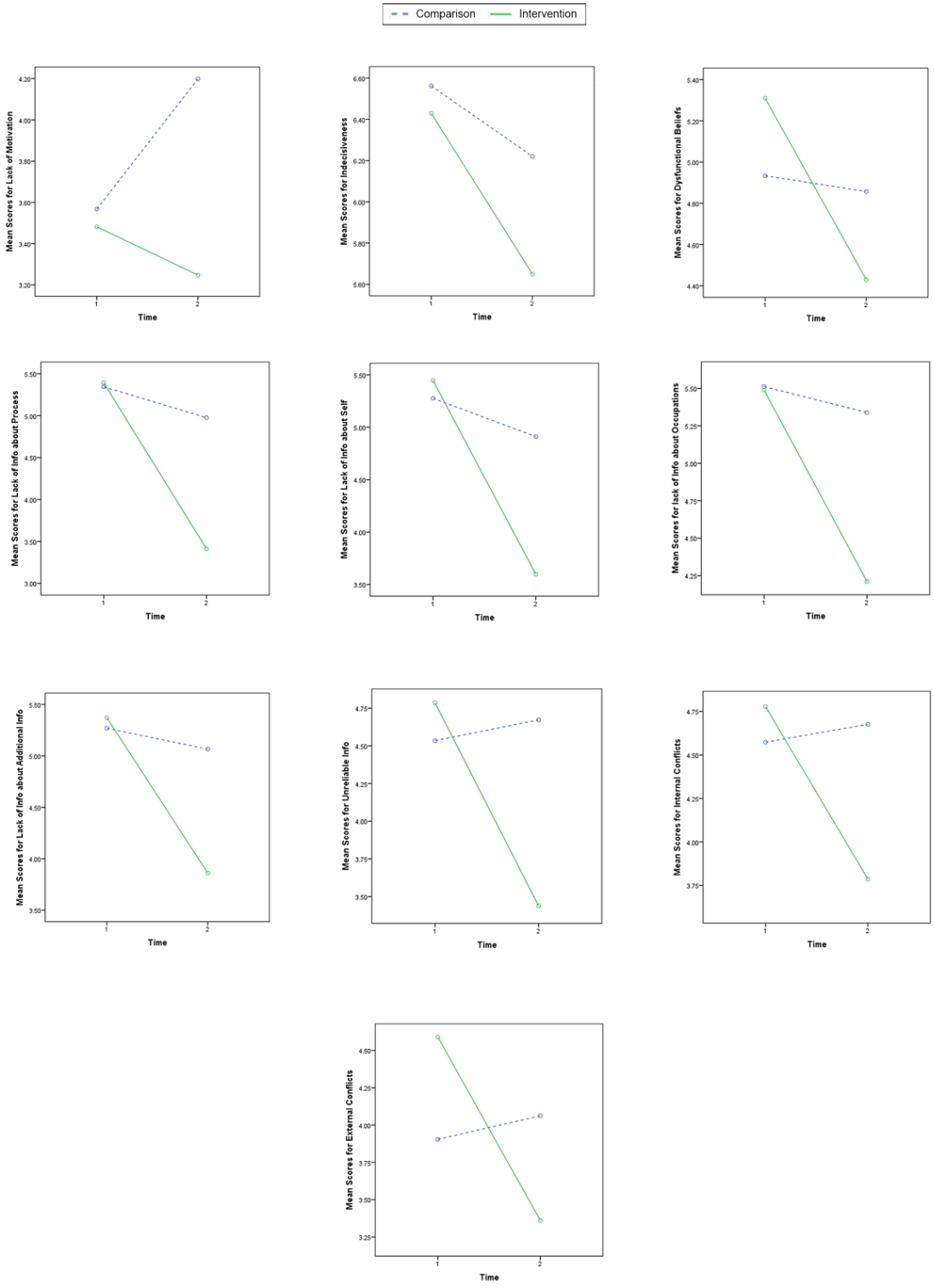


Figure 8.9. Significant Interaction Effects of Group and Time on the 10 subcategories of difficulties

In summary, there were significant interaction effects between group and time on the three main categories and 10 subcategories. Univariate tests revealed that for the three main categories, the differences in scores between the intervention and comparison groups were non-significant at Time 1, but the differences between the two groups were significant at Time 4. Follow-up repeated measures test showed that the change in scores for the comparison group was non-significant, but the decrease in decision-making difficulties for the three main categories was significant for the intervention group. Univariate tests showed that of the ten subcategories, scores for the dysfunctional beliefs subcategory for comparison and intervention groups were not significantly different at both times. Follow-up repeated measures tests showed that the decrease in the ten subcategories of difficulties was statistically significant for the intervention group except for lack of motivation where the decrease was non-significant. In fact, there was a significant increase in the difficulties related to the lack of motivation for the comparison group at Time 4. In addition, the comparison group also recorded a significant decrease in difficulties related to general indecisiveness at Time 4. The intervention group recorded the largest effect sizes for the *lack of information* category and subcategories, while the *lack of readiness* category and subcategories recorded the smallest effect sizes. This suggests that the intervention had the largest impact on difficulties related to the *lack of information*.

Table 8.3 displays the pre-test and post-test scores for CDDQr total, main and subcategory scores for the intervention and comparison groups, and the interaction effects. Table 8.4 displays the differences in mean scores between

Time 1 and Time 4 for the intervention and comparison group, *F*-test results, significance and effect sizes.

Table 8.3

Pre- and post-test scores for the CDDQr total, main and subcategories for the intervention and comparison groups, and interaction effects

		Intervention		**Comparison**				
CDDQr		M	SD	M	SD	*F*	*p*	partial η²
Lack of Readiness	Pre	5.10	1.00	5.01	1.10	21.69	.000	.09
	Post	4.44	1.16	5.07	1.19			
Motivation	Pre	3.48	1.59	3.57	1.75	12.56	.000	.05
	Post	3.25	1.73	4.20	1.77			
General Indecisiveness	Pre	6.43	1.77	6.56	1.59	4.04	.046	.02
	Post	5.65	1.88	6.22	1.78			
Dysfunctional Beliefs	Pre	5.31	1.56	4.93	1.62	11.48	.001	.05
	Post	4.43	1.75	4.86	1.51			
Lack of Information	Pre	5.43	1.83	5.35	1.98	31.13	.000	.12
	Post	3.75	1.76	5.06	1.96			
CDM Process	Pre	5.39	2.11	5.34	2.15	28.49	.000	.12
	Post	3.41	1.90	4.98	2.20			
Self	Pre	5.45	2.15	5.28	2.28	29.01	.000	.12
	Post	3.60	1.94	4.91	2.16			
Occupations	Pre	5.48	2.20	5.51	2.18	12.94	.000	.06
	Post	4.21	2.10	5.34	2.10			
Additional Information	Pre	5.37	2.09	5.27	2.26	17.18	.000	.07
	Post	3.86	2.08	5.07	2.14			
Inconsistent Information	Pre	4.74	1.50	4.43	1.58	38.97	.000	.10
	Post	3.60	1.80	4.55	1.77			
Unreliable Information	Pre	4.79	1.81	4.53	1.92	26.57	.000	.11
	Post	3.43	1.97	4.67	1.96			
Internal Conflicts	Pre	4.78	1.72	4.57	1.82	22.15	.000	.09
	Post	3.79	2.00	4.68	1.88			
External Conflicts	Pre	4.59	2.56	3.91	2.27	20.41	.000	.09
	Post	3.36	2.14	4.06	2.19			
Total Scale	Pre	5.11	1.20	4.96	1.36	47.62	.000	.18
	Post	3.92	1.41	4.90	1.50			

Note: Interaction effects (Group x Time) are reported

Table 8.4

Differences in mean scores between Time 1 and Time 4 for the intervention and comparison groups, F-test results, significance and effect sizes.

CDDQr		*M* diff	*F*	*p*	partial ŋ²
Lack of Readiness	Intervention	0.66	30.94	.000	.24
	Comparison	0.06	0.32	.572	.00
Motivation	Intervention	0.12	0.98	.323	.00
	Comparison	0.63	14.48	.000	.11
General Indecisiveness	Intervention	0.78	21.17	.000	.18
	Comparison	0.34	5.96	.016	.05
Dysfunctional Beliefs	Intervention	0.88	20.07	.000	.17
	Comparison	0.08	0.29	.590	.00
Lack of Information	Intervention	1.68	66.78	.000	.40
	Comparison	0.29	3.80	.054	.03
CDM Process	Intervention	1.98	71.93	.000	.42
	Comparison	0.37	3.58	.061	.03
Self	Intervention	1.85	66.79	.000	.40
	Comparison	0.37	4.84	.030	.04
Various Occupations	Intervention	1.28	25.15	.000	.20
	Comparison	0.17	0.90	.344	.00
Obtaining Additional Information	Intervention	1.51	34.68	.000	.26
	Comparison	0.20	1.10	.296	.01
Inconsistent information	Intervention	1.15	48.36	.000	.33
	Comparison	0.12	0.98	.323	.00
Unreliable Information	Intervention	1.35	35.16	.000	.26
	Comparison	0.14	0.57	.452	.01
Internal Conflicts	Intervention	0.99	29.05	.000	.23
	Comparison	0.10	0.49	.487	.00
External Conflicts	Intervention	1.23	24.54	.000	.20
	Comparison	0.16	0.69	.407	.01
Total Scale	Intervention	1.44	77.44	.000	.44
	Comparison	0.05	0.28	.597	.00

Note: *M* diff = Mean difference

8.4.3.5 Results for repeated measures ANOVA for decision-making difficulties for the intervention group only over four time points

Mauchly's test of sphericity indicated that the assumption of sphericity had been violated, $p < .001$. Therefore, the Greenhouse-Geisser correction was

applied (ε = .77) to correct the one-way repeated measures (Maxwell & Delaney, 2004). Scores for career decision-making difficulties as measured by the CDDQr were significantly different at different time points, F (2.31, 230.63) = 63.11, $p < .001$, partial $\eta^2 = .39$. Post-hoc analysis with a Bonferroni adjustment revealed that the slight increase in decision-making difficulties from Time 1 (M = 5.11, SD = 1.20) to Time 2 (M = 5.16, SD = 1.24) was non-significant, p = 1.00). However, decision-making difficulties decreased significantly post-intervention from Time 2 to Time 3 (M = 4.06, SD = 1.34), a mean difference of 1.10, 95% CI (0.77, 1.42), $p < .001$. Although there was a further decrease in decision-making difficulties from Time 3 to Time 4 (M = 3.92, SD = 1.41), the decrease was non-significant (p = 1.00). Figure 8.10 depicts the mean scores for decision-making difficulties at four time points.

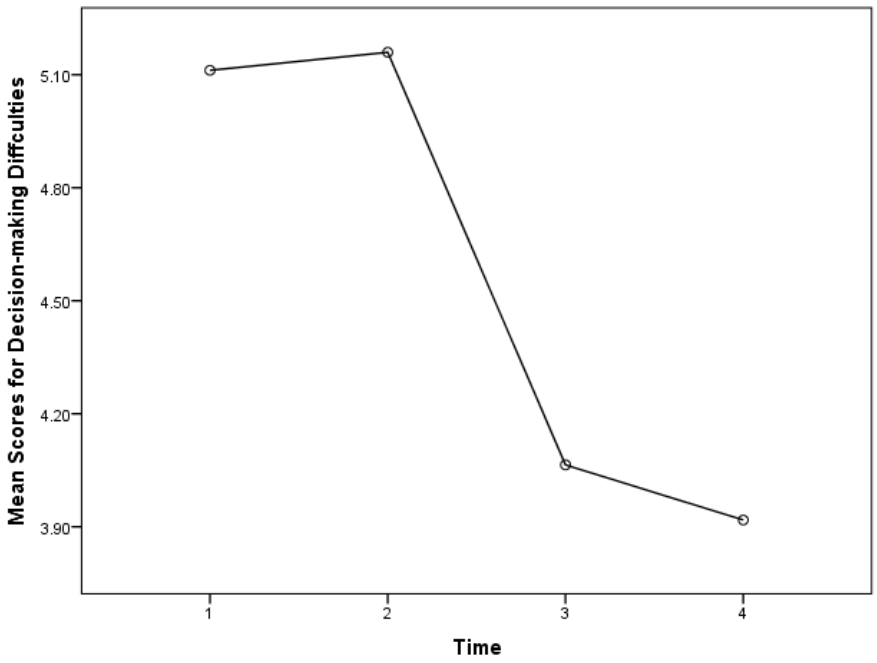


Figure 8.10. Mean scores for Career Decision-Making Difficulties at four time points

8.4.3.6 Results for repeated measures ANOVA for main and subcategories of decision-making difficulties for the intervention group only over four time points

Repeated measures ANOVA was conducted for main and subcategories of the CDDQr. The results for each category are presented below.

(1) Lack of readiness

For data on the lack of readiness category of difficulties, Mauchly's test of sphericity indicated that the assumption of sphericity had been violated, $p < .001$. Therefore, the Greenhouse-Geisser correction was applied ($\varepsilon = .85$) to correct the one-way repeated measures (Maxwell & Delaney, 2004). Scores for difficulties related to *readiness* were significantly different at different time points, F (2.55, 254.76) = 20.21, $p < .001$, partial $\eta^2 = .17$. Post-hoc analysis with a Bonferroni adjustment revealed that the slight decrease in difficulties related to *readiness* from Time 1 (M = 5.10, SD = 1.00) to Time 2 (M = 5.00, SD = 1.08) was non-significant (p = 1.00). However, difficulties related to *readiness* decreased significantly from Time 2 to Time 3 (M = 4.46, SD = 1.16), a mean difference of 1.16, 95% CI (0.22, 0.87), $p < .001$. Although there was a slight decrease in difficulties related to *readiness* from Time 3 to Time 4 (M = 4.44, SD = 1.16), the decrease was non-significant (p = 1.00).

(a) Lack of motivation

The assumption of sphericity had been violated, as assessed by Mauchly's test of sphericity, $p < .001$. Therefore, the Greenhouse-Geisser correction was applied ($\varepsilon = 0.85$) to correct the one-way repeated measures (Maxwell & Delaney, 2004). The differences in scores for difficulties related to the lack of *motivation* were not significantly different at different time points, F (2.55, 255.15) = 1.20, $p = .311$, partial $\eta^2 = .01$. Post-hoc analysis with a Bonferroni adjustment revealed that the decrease in difficulties related to the lack of *motivation* from Time 1 ($M = 3.48$, SD = 1.59) to Time 2 ($M = 3.31$, SD = 1.60) was non-significant ($p = 1.00$). The decrease in difficulties related to *motivation* was also not significant from Time 2 to Time 3 ($M = 3.19$, SD = 1.58, $p = 1.00$). Although there was a slight increase in difficulties related to lack of *motivation* from Time 3 to Time 4 ($M = 3.25$, SD = 1.73), the increase was non-significant ($p = 1.00$).

(b) General indecisiveness

Mauchly's test of sphericity indicated that the assumption of sphericity had been violated, $p = .020$. Therefore, the Greenhouse-Geisser correction was applied ($\varepsilon = .92$) to correct the one-way repeated measures (Maxwell & Delaney, 2004). Scores for difficulties related to general indecisiveness were significantly different at different time points, F (2.75, 275.18) = 21.35, $p < .001$, partial $\eta^2 = .18$. Post-hoc analysis with a Bonferroni adjustment revealed that the slight increase in difficulties related to general indecisiveness from Time 1 ($M = 6.43$, SD = 1.77) to Time 2 ($M = 6.61$, SD = 1.70) was non-significant ($p = 1.00$). However, difficulties related to general indecisiveness

decreased significantly from Time 2 to Time 3 (M = 5.65, SD = 1.87), a mean difference of 0.96, 95% CI (0.52, 1.40), $p < .001$.The level of difficulties related to general indecisiveness was maintained at Time 4 (M = 5.65, SD = 1.88), p = 1.00.

(c) Dysfunctional beliefs

The assumption of sphericity had been violated, as assessed by Mauchly's test of sphericity, $p < .001$. Therefore, the Greenhouse-Geisser correction was applied ($\varepsilon = .81$) to correct the one-way repeated measures (Maxwell & Delaney, 2004). Scores for difficulties related to dysfunctional beliefs were significantly different at different time points, F (2.42, 241.98) = 12.30, $p <$ .001, partial $\eta^2 = .11$. Post-hoc analysis with a Bonferroni adjustment revealed that the slight decrease in difficulties related to dysfunctional beliefs from Time 1 (M = 5.31, SD = 1.56) to Time 2 (M = 5.07, SD = 1.63) was non-significant (p = .279). However, difficulties related to dysfunctional beliefs decreased significantly from Time 2 to Time 3 (M = 4.51, SD = 1.69), a mean difference of 0.56, 95% CI (0.09, 1.03), p = .012. Although there was a slight decrease in difficulties related to dysfunctional beliefs from Time 3 to Time 4 (M = 4.43, SD = 1.75), the decrease was non-significant (p = 1.00).

Figure 8.11 depicts the mean scores for the main category Readiness and its three subcategories at four time points

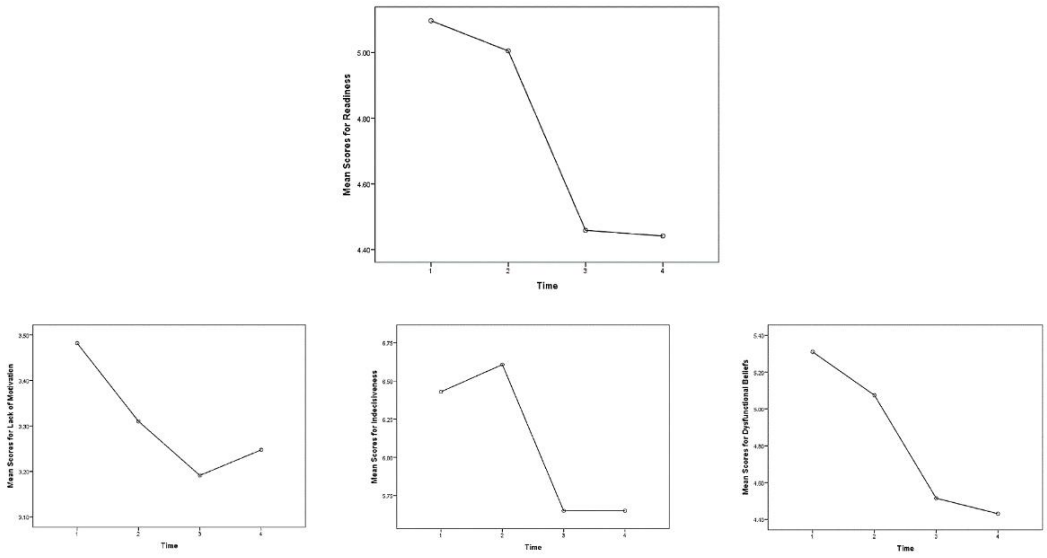


Figure 8.11. Mean scores for the main category Readiness and its three subcategories at four time points

(2) Lack of Information

For data on the lack of information category of difficulties, the assumption of sphericity was violated, as assessed by Mauchly's test of sphericity, $p < .001$. Therefore, a Greenhouse-Geisser correction was applied ($\varepsilon = .76$) to correct the one-way repeated measures (Maxwell & Delaney, 2004). Scores for difficulties related to the lack of information were significantly different at different time points, F (2.28, 228.34) = 60.22, $p < .001$, partial $\eta^2 = .38$. Post-hoc analysis with a Bonferroni adjustment revealed that the slight increase in difficulties related to the lack of information from Time 1 (M = 5.43, SD = 1.83) to Time 2 (M = 5.56, SD = 1.71) was non-significant (p = 1.00). However, difficulties related to the lack of information decreased significantly from Time 2 to Time 3 (M = 3.96, SD = 1.77), a mean difference of 1.60, 95% CI (1.12, 2.07), $p <$ .001. Although there was a slight decrease in difficulties related to the lack of

information from Time 3 to Time 4 (M = 3.75, SD = 1.76), the decrease was non-significant (p = .966).

(a) Lack of information about the CDM process

Mauchly's test of sphericity indicated that the assumption of sphericity had been violated, $p < .001$. Therefore, the Greenhouse-Geisser correction was applied ($\varepsilon = .82$) to correct the one-way repeated measures (Maxwell & Delaney, 2004). Scores for difficulties related to lack of information about the CDM process were significantly different at different time points, F (2.45, 245.02) = 53.81, $p < .001$, partial $\eta^2 = .35$. Post-hoc analysis with a Bonferroni adjustment revealed that the slight increase in difficulties related to lack of information about the CDM process from Time 1 (M = 5.39, SD = 2.11) to Time 2 (M = 5.57, SD = 1.98) was non-significant (p = 1.00). However, difficulties related to lack of information about the CDM process decreased significantly from Time 2 to Time 3 (M = 3.77, SD = 2.15), a mean difference of 1.81, 95% CI (1.20, 2.41), $p < .001$.The level of difficulties related to lack of information about the CDM process decreased slightly from Time 3 to Time 4 (M = 3.41, SD = 1.90), but the change was non-significant (p = .240).

(b) Lack of information about self

The assumption of sphericity was violated, as assessed by Mauchly's test of sphericity, $p < .001$. Therefore, a Greenhouse-Geisser correction was applied ($\varepsilon = .80$) to correct the one-way repeated measures (Maxwell & Delaney, 2004). Scores for difficulties related to the lack of information about self were significantly different at different time points, F (2.39, 239.03) = 56.60, $p <$

.001, partial ŋ² = .36. Post-hoc analysis with a Bonferroni adjustment revealed that the slight decrease in difficulties related to the lack of information about self from Time 1 (*M* = 5.45, SD = 2.15) to Time 2 (*M* = 5.48, SD = 2.07) was non-significant (*p* = 1.00). However, difficulties related to the lack of information about self decreased significantly from Time 2 to Time 3 (*M* = 3.78, SD = 1.92), a mean difference of 1.71, 95% CI (1.17, 2.24), *p* < .001. Although there was a further decrease in difficulties related to the lack of information about self from Time 3 to Time 4 (*M* = 3.60, SD = 1.94), the decrease was non-significant (*p* = 1.00).

(c) Lack of information about occupations

Mauchly's test of sphericity indicated that the assumption of sphericity had been violated, *p* < .001. Therefore, the Greenhouse-Geisser correction was applied (ε = .80) to correct the one-way repeated measures (Maxwell & Delaney, 2004). Scores for difficulties related to lack of information about occupation were significantly different at different time points, *F* (2.40, 239.51) = 22.27, *p* < .001, partial ŋ² = .18. Post-hoc analysis with a Bonferroni adjustment revealed that the slight increase in difficulties related to lack of information about occupations from Time 1 (*M* = 5.49, SD = 2.20) to Time 2 (*M* = 5.72, SD = 2.15) was non-significant (*p* = .980). However, difficulties related to lack of information about occupations decreased significantly from Time 2 to Time 3 (*M* = 4.47, SD = 2.15), a mean difference of 1.25, 95% CI (0.64, 1.86), *p* < .001.The level of difficulties related to lack of information about occupations decreased slightly from Time 3 to Time 4 (*M* = 4.21, SD = 2.10), but the change was non-significant (*p* = 1.00).

(d) Lack of information about ways of obtaining additional information

The assumption of sphericity was violated, as assessed by Mauchly's test of sphericity, $p < .001$. Therefore, a Greenhouse-Geisser correction was applied ($\varepsilon = .83$) to correct the one-way repeated measures (Maxwell & Delaney, 2004). Scores for difficulties related to the lack of information about ways to obtain additional information were significantly different at different time points, $F(2.49, 248.79) = 33.36$, $p < .001$, partial $\eta^2 = .25$. Post-hoc analysis with a Bonferroni adjustment revealed that the slight decrease in difficulties related to the lack of information about ways of obtaining additional information from Time 1 ($M = 5.37$, SD = 2.09) to Time 2 ($M = 5.43$, SD = 1.95) was non-significant ($p = 1.00$). However, difficulties related to the lack of information about ways of obtaining additional information decreased significantly from Time 2 to Time 3 ($M = 3.84$, SD = 2.04), a mean difference of 1.59, 95% CI (1.03, 2.16), $p < .001$. Although there was a slight increase in difficulties related to the lack of information about ways of obtaining additional information from Time 3 to Time 4 ($M = 3.86$, SD = 2.08), the decrease was non-significant ($p = 1.00$).

Figure 8.12 depicts the mean scores for the main category Lack of Information and its four subcategories at four time points

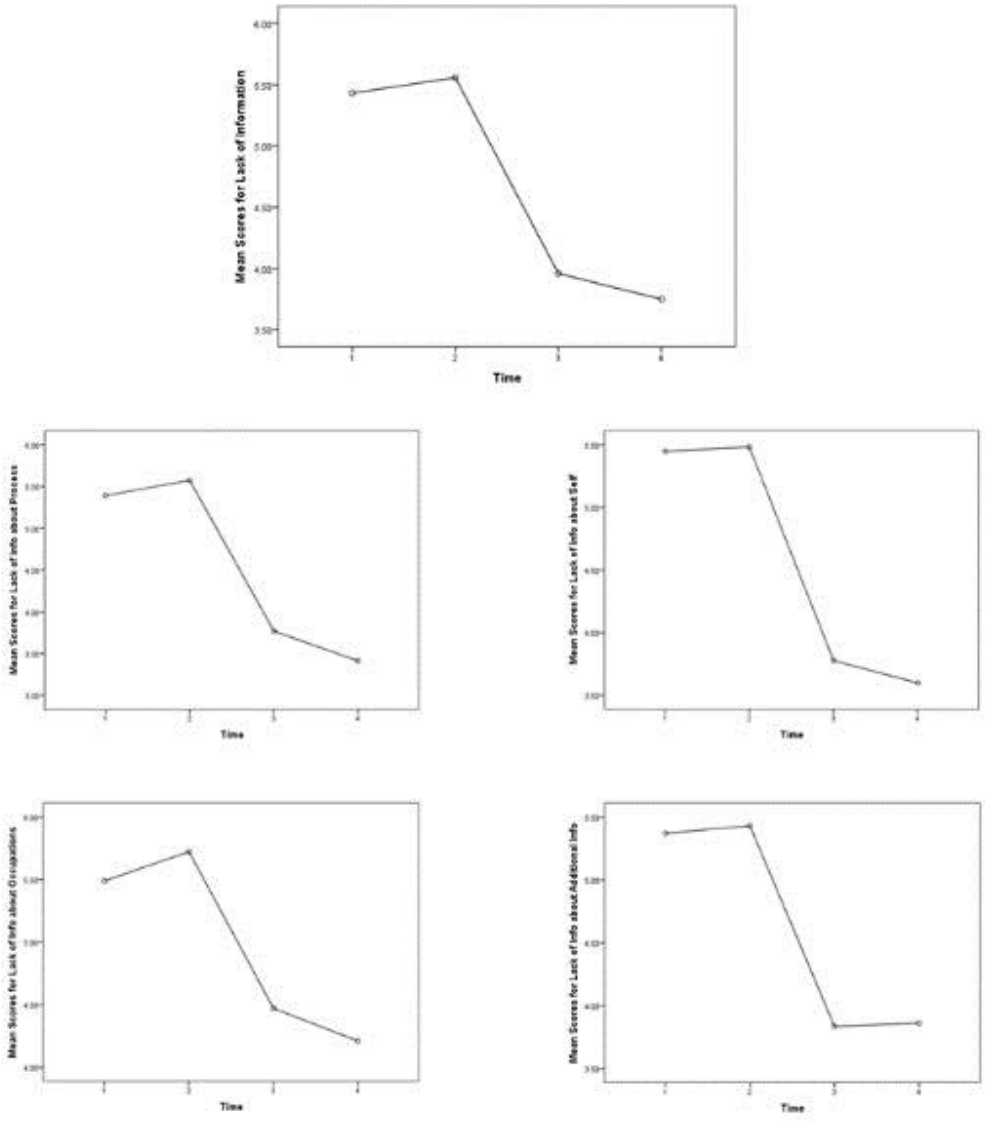


Figure 8.12. Mean scores for the main category Lack of information and its four subcategories at four time points

3) Inconsistent information

For data on the inconsistent information category of difficulties, the assumption of sphericity was violated, as assessed by Mauchly's test of sphericity, $p < .001$. Therefore, a Greenhouse-Geisser correction was applied (ε

= .79) to correct the one-way repeated measures (Maxwell & Delaney, 2004). Scores for difficulties related to inconsistent information were significantly different at different time points, F (2.37, 237.41) = 39.82, $p < .001$, partial η^2 = .29. Post-hoc analysis with a Bonferroni adjustment revealed that the slight increase in difficulties related to inconsistent information from Time 1 (M = 4.74, SD = 1.50) to Time 2 (M = 4.84, SD = 1.54) was non-significant (p = 1.00). However, difficulties related to inconsistent information decreased significantly from Time 2 to Time 3 (M = 3.80, SD = 1.57), a mean difference of 1.04, 95% CI (0.66, 1.42), $p < .001$. Although there was a slight decrease in difficulties related to inconsistent information from Time 3 to Time 4 (M = 3.60, SD = 1.80), the decrease was non-significant (p = .931).

(a) Unreliable information

Mauchly's test of sphericity indicated that the assumption of sphericity had been violated, $p < .001$. Therefore, the Greenhouse-Geisser correction was applied (ε = .80) to correct the one-way repeated measures (Maxwell & Delaney, 2004). Scores for difficulties related to unreliable information were significantly different at different time points, F (2.39, 238.92) = 31.40, $p <$ .001, partial η^2 = .24. Post-hoc analysis with a Bonferroni adjustment revealed that the slight increase in difficulties related to unreliable information from Time 1 (M = 4.79, SD = 1.81) to Time 2 (M = 4.90, SD = 1.80) was non-significant (p = 1.00). However, difficulties related to unreliable information decreased significantly from Time 2 to Time 3 (M = 3.62, SD = 1.90), a mean difference of 1.28, 95% CI (0.78, 1.78), $p < .001$.The level of difficulties

related to unreliable information decreased slightly from Time 3 to Time 4 (M = 3.44, SD = 1.97), but the change was non-significant (p = 1.00).

(b) Internal conflicts

The assumption of sphericity was violated, as assessed by Mauchly's test of sphericity, $p < .001$. Therefore, a Greenhouse-Geisser correction was applied (ε = .86) to correct the one-way repeated measures (Maxwell & Delaney, 2004). Scores for difficulties related to internal conflicts were significantly different at different time points, F (2.59, 258.65) = 25.35, $p < .001$, partial η^2 = .20. Post-hoc analysis with a Bonferroni adjustment revealed that the slight decrease in difficulties related to internal conflicts from Time 1 (M = 4.78, SD = 1.72) to Time 2 (M = 4.95, SD = 1.68) was non-significant (p = 1.00). However, difficulties related to internal conflicts decreased significantly from Time 2 to Time 3 (M = 3.93, SD = 1.69), a mean difference of 1.01, 95% CI (0.57, 1.46), $p < .001$. Although there was a slight decrease in difficulties related to internal conflicts from Time 3 to Time 4 (M = 3.79, SD = 2.00), the decrease was non-significant (p = 1.00).

(c) External conflicts

Mauchly's test of sphericity indicated that the assumption of sphericity had been violated, $p < .001$. Therefore, the Greenhouse-Geisser correction was applied (ε = .78) to correct the one-way repeated measures (Maxwell & Delaney, 2004). Scores for difficulties related to external conflicts were significantly different at different time points, F (2.33, 233.49) = 14.86, $p <$ .001, partial η^2 = .13. Post-hoc analysis with a Bonferroni adjustment revealed

that the slight decrease in difficulties related to external conflicts from Time 1 (*M* = 4.59, SD = 2.56) to Time 2 (*M* = 4.47, SD = 2.43) was non-significant (*p* = 1.00). However, difficulties related to external conflicts decreased significantly from Time 2 to Time 3 (*M* = 3.72, SD = 2.27), a mean difference of 0.75, 95% CI (0.16, 1.34), *p* = .006.The level of difficulties related to external conflicts decreased slightly from Time 3 to Time 4 (*M* = 3.36, SD = 2.14), but the change was non-significant (*p* = .422). Figure 8.13 depicts the mean scores for the main category Inconsistent Information and its three subcategories at four time points.

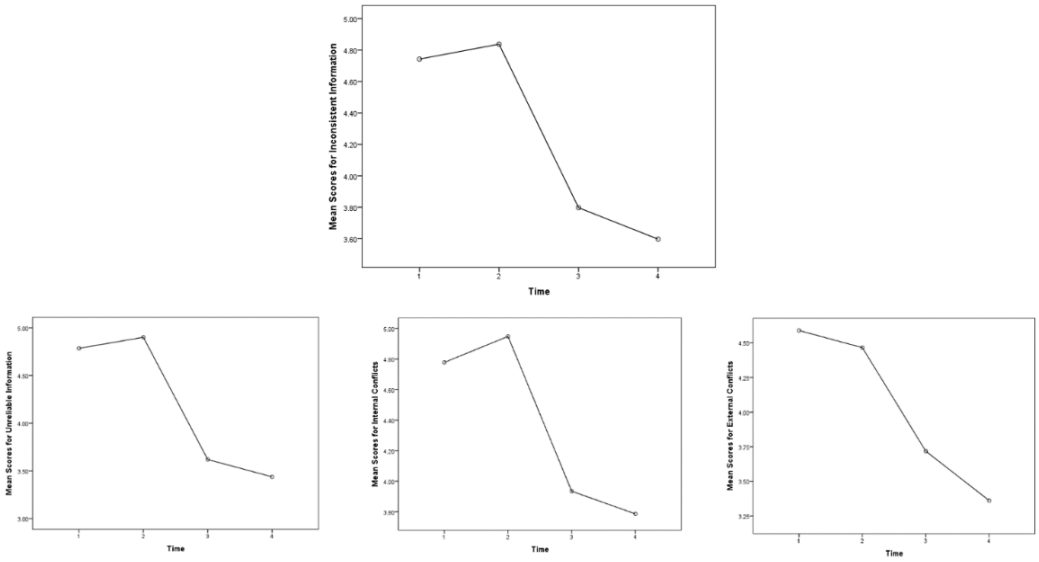


Figure 8.13. Mean scores for the main category Inconsistent Information and its three subcategories at four time points

In summary, the intervention elicited statistically significant decreases in decision-making difficulties except for difficulties related to the lack of motivation where the decrease was not significant. In the period before the intervention, the changes in scores for all main and subcategories were non-

significant. The effects of the intervention were maintained four weeks later where the changes in scores were again non-significant. A summary of the results can be found in Table 8.5 below.

Table 8.5

Summary of results for CDMSE, career indecision and decision-making difficulties from mixed ANOVA for intervention and comparison groups, and from repeated measures for the intervention group only.

CDMSE					
Mixed ANOVA	Interaction effects	Between subject at Time 1	Between subject at Time 4	Group	Within subject
Total scale	S	NS	S	Intervention	S
				Comparison	NS
OI	S	NS	S	Intervention	S
				Comparison	S
PS	S	NS	S	Intervention	S
				Comparison	NS
GS	S	NS	S	Intervention	S
				Comparison	NS
DM	S	NS	S	Intervention	S
				Comparison	NS

Repeated measures (intervention group only)	Time 1 to Time 2	Time 2 to Time 3	Time 3 to Time 4
Total scale	S	S	NS
OI	S	S	NS
PS	NS	S	NS
GS	NS	S	NS
DM	S	S	NS

Career indecision					
Mixed ANOVA	Interaction effects	Between subject at Time 1	Between subject at Time 4	Group	Within subject
CDS	S	NS	S	Intervention	S
				Comparison	NS

Repeated measures (intervention group only)	Time 1 to Time 2	Time 2 to Time 3	Time 3 to Time 4
CDS	NS	S	NS

Decision-making difficulties					
Mixed ANOVA	Interaction effects	Between subject at Time 1	Between subject at Time 4	Group	Within subject
Total CDDQr	S	NS	S	Intervention	S
				Comparison	NS
Lack of Readiness	S	NS	S	Intervention	S
				Comparison	NS
Lack of Info	S	NS	S	Intervention	S
				Comparison	NS

(continued)

Table 8.5 (Continued)

Mixed ANOVA	Interaction effects	Between subject at Time 1	Between subject at Time 4	Group	Within subject
Inconsistent Info	S	NS	S	Intervention	S
				Comparison	NS
Lack of motivation	S	NS	S	Intervention	NS
				Comparison	S
General indecisiveness	S	NS	S	Intervention	S
				Comparison	NS
Dysfunctional beliefs	S	NS	NS	Intervention	S
				Comparison	NS
CDM process	S	NS	S	Intervention	S
				Comparison	NS
Self	S	NS	S	Intervention	S
				Comparison	NS
Occupations	S	NS	S	Intervention	S
				Comparison	NS
Additional info	S	NS	S	Intervention	S
				Comparison	NS
Unreliable info	S	NS	S	Intervention	S
				Comparison	NS
Internal conflicts	S	NS	S	Intervention	S
				Comparison	NS
External conflicts	S	NS	S	Intervention	S
				Comparison	NS
Repeated measures (intervention group only)		Time 1 to Time 2	Time 2 to Time 3	Time 3 to Time 4	
Total CDDQr		NS	S	NS	
Lack of Readiness		NS	S	NS	
Lack of Information		NS	S	NS	
Inconsistent Information		NS	S	NS	
Lack of motivation		NS	NS	NS	
General indecisiveness		NS	S	NS	
Dysfunctional beliefs		NS	S	NS	
CDM process		NS	S	NS	
Self		NS	S	NS	
Occupations		NS	S	NS	
Additional info		NS	S	NS	
Unreliable info		NS	S	NS	
Internal conflicts		NS	S	NS	
External conflicts		NS	S	NS	

Note: OI = Occupational information; PS = Problem-solving; GS = Goal-setting; DM = Decision-making; S = Significant; NS = Non-significant

8.5 Discussion of findings

This chapter addresses the second research question regarding the impact of the intervention on CDMSE, career indecision and career decision-making difficulties as assessed by the main instruments. Three hypotheses were

proposed in response to the research question and each of these is discussed in turn below.

Firstly, it was hypothesised that students in the intervention group will exhibit a significant increase in CDMSE as measured by the CDSES-SF and its subscales, and the effects will be maintained four weeks later. The results show that CDMSE increased significantly for the total scale and all four subscales after the intervention at Time 4 for the intervention group compared to the comparison group. The effect sizes for the increase in CDMSE for the intervention group were considered large for the total CDSES-SF scale (partial $\eta^2 = .37$) according to Cohen (1969). Of the four subscales, goal selection recorded the largest effect size, while decision-making recorded the smallest effect size. In analyses for the intervention group only, the results show that there were statistically significant increases in CDMSE as measured by the total scale and all four subscales at Time 3 after the intervention took place compared to the period from Time 1 to Time 2 when there was no intervention. The change in CDMSE and its four subscales from Time 3 to Time 4 was not significant demonstrating that the effects of the intervention were maintained at follow-up four weeks later. These findings are consistent with findings by Scott and Ciani (2008) and Fouad et al. (2009), who also reported significant increases in CDMSE after interventions that incorporated the four sources of information proposed by Bandura (1986) through which self-efficacy is modified. The present study also found that goal selection recorded the largest effect size compared to other subscales, consistent with the findings by Fouad et al. (2009) who also recorded the largest effect size for goal selection

compared to other subscales. Thus, the first hypothesis was fully supported.

These findings lend support to empirical research that interventions based on Crites' (1978) Career Maturity Theory, and provided opportunities to students to be exposed to the four sources of information proposed by Bandura (1986) through which self-efficacy is modified are indeed effective in modifying CDMSE among Malaysian college students. This represents a significant contribution to intervention research because interventions investigating career decision-making generally and CDMSE specifically have never been carried out with this population. Furthermore, the findings reveal that theoretically-based interventions with positive outcomes in other countries have similar effects among a Malaysian population. In addition, this study provided empirical support for the effectiveness of career courses as a viable form of career intervention to increase students' confidence in carrying tasks specific to making career decisions. A more detailed discussion of career interventions can be found in section 11.3.2.

It must be noted, however, based on the attrition analyses in section 8.3.1.3 that participants in the intervention group who completed the course had significantly higher CDMSE scores compared to those who attended the first session at Time 2 but dropped out of the course after that. This finding suggests that those who remained on the course and eventually completed it were more motivated or were more optimistic about their abilities. This finding has important implications for the design and development of interventions to help students, and will be discussed in greater depth in Chapter 11.

Secondly, it was hypothesised that career indecision will be reduced significantly after completing the course and its effect will be maintained four weeks later. This hypothesis was supported as the results show that compared to the comparison group, career indecision decreased significantly at Time 4 for the intervention group. Furthermore, analyses of the intervention group only showed that career indecision reduced significantly post-intervention at Time 3, but not from Time 1 to Time 2 when there was no intervention. The change in career indecision from Time 3 to Time 4 was non-significant indicating that the effects of the intervention were maintained four weeks later. These findings appear to contradict those of Grier-Reed and Skaar (2010) who did not find any corresponding decreases in career indecision despite significant increases in CDMSE post-intervention. However, Grier-Reed and Skaar (2010) did not include a comparison group in their study so the researchers were not able to conclusively attribute the changes in CDMSE to the intervention. The findings of the present study also appear contrary to the findings of Creed et al. (2006) who reported that a change in career indecision was not associated with a change in CDMSE over time. However, their study did not include an intervention that is aimed at increasing CDMSE. Furthermore, their study involved high school students who may not feel the urgent need to make career decisions compared to college students who need to declare a major or as in the case of college students in this sample, who need to state the course they want to pursue in their university applications.

These findings, however, are consistent with the findings by Fukuyama et al. (1988) who examined the effects of DISCOVER, an interactive computer

guidance program, on CDMSE and career indecision among college students and reported positive outcomes, i.e., increased CDMSE and reduced career indecision. As there are few intervention studies that examine both CDMSE and career indecision, the findings of the present study is a significant addition to intervention research. Furthermore, the findings reveal that theoretically-based interventions aimed at increasing CDMSE are effective in reducing career indecision. The relationship between CDMSE and career indecision will be investigated and discussed in greater depth in the next chapter.

Thirdly, it was hypothesised that the intervention group will exhibit a significant reduction in career decision-making difficulties as measured by the CDDQr, and its main and subcategories of difficulties, and the effects will be maintained four weeks later. Career decision-making difficulties as measured by the total CDDQr decreased significantly for the intervention group at Time 4, while the change in career decision-making difficulties in the comparison group was non-significant. The same was demonstrated by the three main categories of difficulties, with difficulties related to the lack of information exhibiting the largest effect size (partial $\eta^2 = .40$) according to Cohen (1969). Analyses of the 10 subcategories of difficulties revealed that difficulties related to the lack of information about the CDM process exhibited the largest effect size (partial $\eta^2 = .42$) for the intervention group. However, difficulties related to the lack of motivation did not decrease significantly for the intervention group, while the comparison group exhibited significant increases at Time 4. The comparison group also exhibited significant decreases in difficulties related to lack information about self at Time 4 although the effect size is not

as large as the intervention group (comparison group, partial $\eta^2 = .04$; intervention group, partial $\eta^2 = .40$). In analyses with the intervention group only, the results showed that there were statistically significant decreases in decision-making difficulties as measured by the total CDDQr and the three main categories at Time 3 after the intervention took place compared to the period from Time 1 to Time 2 when there was no intervention. A closer examination of the scores for the 10 subcategories showed significant decreases after the intervention except for difficulties related to the lack of motivation where the decrease was non-significant.

Difficulties related to lack of information about the CDM process recorded the largest decrease followed by difficulties related to lack of information on self. Difficulties related to dysfunctional beliefs recorded the smallest decrease after lack of motivation. The change in decision-making difficulties and its three main and 10 subcategories from Time 3 to Time 4 was not significant demonstrating that the effects of the intervention were maintained at follow-up four weeks later. These findings are consistent with the findings of Reese and Miller (2006) and Fouad et al. (2009) who reported significant decreases in decision-making difficulties after career courses that were focused on increasing CDMSE. Interestingly, Reese and Miller (2006) reported an increase in difficulties related to the lack of motivation while the present study did not find the decrease in the lack of motivation to be significant post-intervention. The researchers attributed this finding to fatigue as their course spanned 15 weeks. As difficulties related to the lack of motivation was not specifically addressed in the present study, this finding has important

implications for the design and development of career intervention courses. This will be discussed in detail in Chapter 11. Reese and Miller (2006) and Fouad et al. (2009) also reported the greatest reduction in difficulties in the lack of information category. Thus, our third hypothesis was only partially supported.

There are few intervention studies that examine both CDMSE and decision-making difficulties. For example, of the studies reviewed in Chapter three, only one study by Fouad et al. (2009) investigated an intervention that incorporated the four sources of information proposed by Bandura (1986) on which self-efficacy is modified to increase CDMSE and reduce decision-making difficulties, and reported positive treatment gains. However, their study did not use a control group. Therefore, the findings of the present study contributes significantly to intervention research because both CDMSE and decision-making difficulties are examined as treatment effects of a theoretically-based intervention and a comparison group has been included to show that the changes in CDMSE and decision-making difficulties can be attributed to the intervention. The relationship between CDMSE and decision-making difficulties will be investigated and discussed in greater depth in the next chapter.

In summary, the intervention was effective in increasing CDMSE and in reducing career indecision, and decision-making difficulties. This is evident from the comparison between the intervention and comparison groups at Time 1 and Time 4, and from the comparison between conditions (with and without

intervention) for the intervention group only. For CDMSE, the intervention had the largest impact on goal selection compared to the other subscales. For decision-making difficulties, the intervention had the largest impact on difficulties related to the lack of information, specifically for difficulties related to lack of information about the CDM process.

These findings were corroborated by the qualitative data elicited from the feedback forms and email interviews which will be discussed below.

8.6 Feedback forms

A total of 120 feedback forms were completed and returned by participants from the intervention group immediately after the intervention. Responses to two questions were analysed regarding the effectiveness of the intervention in increasing CDMSE, and in reducing career indecision and career decision-making difficulties. Frequency data are presented.

The two questions are as follows:

(1) Have you decided on a course or career?

(2) Did the course help you in making career decisions?

Of the 120 students who responded, 74 students reported that they had made a course or career decision (61.67%) while 46 students indicated that they had not (38.33%).

As to whether the course had helped them in making career decisions, 108 students replied in the affirmative (90%) while 14 students replied in the negative (10%). Of the students who replied in the negative, one student explained that he had already made his career decision prior to attending the course so the question was not relevant to him; one student reported that the course had given him more options to consider when making a decision; and two students said that they had narrowed down some options and were close to deciding. The other 10 students reported that they were still undecided, and needed more time or research before deciding.

Even students who reported that they had not made a career decision in response to the first question said that the course had helped them in making career decisions. Of the 46 students who reported that they had not make a career decision, 37 of them (80.43%) noted that the course had helped them in some way.

In summary, the majority of students who underwent the intervention responded that the intervention helped them in making career decisions. Sample responses from students for the other questions can be found in Appendix G.

8.7 Email interviews

Emails containing interview questions were sent to 101 students after they had completed the follow-up questionnaires four weeks after the intervention. The

response rate was low with only 27 students responding with replies (26.73%). Responses to all five questions were analysed regarding the effectiveness of the intervention in increasing CDMSE, and in reducing career indecision and career decision-making difficulties.

(1) Have you made a career or course decision?

Of the 27 students who responded, 18 students reported that they had made a course or career decision (66.67%), while two students said they were deciding between two courses or careers, and two students reported that since the course, they were reconsidering their initial decision.

(2) If yes, how has the course helped you? If no, please explain why.

Students who had made their course or career decisions reported that the course had increased their confidence in making career decisions; had widened their knowledge about careers and occupations; had helped them identify their strengths and weaknesses; and had helped them realise what their personal values were.

(3) If you have not made a career or course decision, what is preventing you from making a decision?

Students who have not made a course or career decision reported difficulties in overall confidence in making career decisions, fear of failure, lack of

information about themselves, their abilities and careers, a lack of readiness to commit to one course, inconsistent information and poor results.

(4) If you have made a decision, what were some of the career decision-making difficulties that you overcame?

Students reported that they had overcome self-defeating thoughts, lack of confidence in choosing a career, and difficulties related to the lack of information.

(5) There are five key competencies in making career decisions. Did your confidence in any these key competencies increase after the course?

Most students reported an increase in confidence in selecting goals (48%), followed by occupational information (37%), self-appraisal (33%), problem-solving (33%), and planning (22%).

In summary, consistent with the findings of the earlier statistical analyses, most students who responded to the email interviews said that the course had helped in increasing their confidence in goal selection, and in reducing difficulties related to the lack of information. Sample replies from students can be found in Appendix G.

8.8 Chapter summary and conclusions

This chapter has presented the statistical and descriptive analyses of data collected for this study, and has sought to answer the second research question on the impact of the intervention on CDMSE, career indecision and career decision-making difficulties.

Overall, the results show that the intervention was effective in increasing CDMSE, and in reducing career indecision and career decision-making difficulties. The findings lend empirical support to research that interventions based on Crites' (1971) Career Maturity Theory, that also incorporate the four sources of information on which self-efficacy is based proposed by Bandura (1986) are effective in increasing CDMSE, and in reducing career indecision. Hypotheses regarding CDMSE and career indecision were fully supported while the hypothesis concerning decision-making difficulties was partially supported. The intervention had the largest effect on goal selection, and in addressing difficulties related to the lack of information consistent with findings by other researchers. Within the lack of information category of difficulties, the lack of information concerning the career decision-making process had the largest effect. Difficulties related to readiness, on the other hand, specifically concerning the lack of motivation, appear to be least affected by the intervention.

Intervention research such as this one provides empirical support for the effectiveness of career courses in helping students make career decision.

Specifically, career courses that incorporate Bandura's (1986) four sources of information on which self-efficacy is based, and the five critical components of effective career courses by Brown and Ryan Krane (2000) are effective in increasing CDMSE and in reducing career indecision and decision-making difficulties.

The findings of this chapter represent a significant addition to intervention research as there are few intervention studies that examine career indecision and decision-making difficulties as treatment outcomes, and none to my knowledge with a Malaysian population.

More in-depth discussion concerning the implications of these findings will be presented in Chapter 11.

The next chapter addresses research questions three and four concerning the relationship between CDMSE and career indecision, and between CDMSE and decision-making difficulties.

CHAPTER 9 – RELATIONSHIP BETWEEN CDMSE AND CAREER INDECISION, AND BETWEEN CDMSE AND DECISION-MAKING DIFFICULTIES

9.1 Chapter overview

This chapter addresses the third and fourth research questions regarding the relationship between CDMSE and career indecision, and between CDMSE and career decision-making difficulties. It begins with a brief background and purpose of the present investigation, followed by a description of and justification for the statistical methods chosen to analyse the data. This is then followed by a presentation of the results of the analyses and a discussion of the findings. This chapter concludes with a summary of the key points.

9.2 The present investigation

Several studies have found that CDMSE is moderately and negatively related to career indecision (e.g., Taylor & Betz, 1983; Taylor & Popma, 1990; and Bergeron & Romano, 1994). In these studies, students who have higher levels of career indecision also reported lower self-efficacy in carrying out decision-making tasks. Several studies have also reported that CDMSE is a predictor of career indecision based on cross-sectional regression models (e.g., Betz & Voyten, 1997, Taylor & Popma, 1990).

Similarly, CDMSE has been found to be strongly related to career decision-making difficulties (Osipow & Gati, 1998, and Amir & Gati, 2006). Students who reported greater decision-making difficulties also reported lower levels of CDMSE. The CDDQ, which is used to measure career decision-making difficulties, has been found to be highly correlated with the CDS, which is used to measure career indecision, indicating that students who have high levels of career indecision also perceive greater difficulties in making career decisions (Osipow & Gati, 1998). These studies show that these three constructs are closely related. However, there is a paucity in intervention outcome studies that relate all these three constructs together. Therefore, an investigation into the relationships among the three constructs will contribute to our understanding of how these constructs affect one another.

Moreover, while career indecision has been assumed to be causally linked to CDMSE, there are only two studies that have examined this direction of the relationship in longitudinal research designs (i.e., Creed et al., 2006; Grier-Reed & Skaar, 2010). Both of these studies have concluded that CDMSE and career indecision are not causally related. The causal relationship between CDMSE and career decision-making difficulties have not been examined.

It is crucial to determine if CDMSE and career indecision, and if CDMSE and career decision-making are causally linked because this will have an impact on interventions that are designed to help undecided students and those experiencing decision-making difficulties. For example, as per the suggestion by Creed et al. (2006), if CDMSE and career indecision are not causally linked,

then career practitioners and developers of career interventions should look at dealing with career indecision in a direct manner, rather than focusing on enhancing CDMSE with the expectation that this will contribute to a reduction in indecision (Creed et al., 2006). Furthermore, it has been hypothesised within the social cognitive career theory (SCCT by Lent et al., 1994) which draws on Bandura's social cognitive theory (1986) that self-efficacy influences outcome expectations which in turn influence behavioural outcomes. Using SCCT as a framework to describe the career decision-making process, CDMSE is presumed to be a causal antecedent to career indecision. Therefore, findings of research into the relationship between CDMSE and career indecision will also have important theoretical implications.

The present investigation examines the relationship between CDMSE and career indecision, and between CDMSE and decision-making difficulties. The findings of this investigation will significantly advance our understanding of how these constructs affect one another.

9.3 Statistical methods used to explore relationships between variables

According to Tabachnick and Fidel (2014), correlational analyses are used to assess the relationship between variables, while regression analyses allow one to assess the relationship between one dependent variable (outcome variables) and several independent variables (predictor variables). Regression is used when the intent of the analysis is prediction (Tabachnick & Fidel, 2014). For the purposes of the present study, correlation analyses were performed as

preliminary analyses to ensure that all predictor variables are significantly related to the outcome variables before including them in the regression model. As mentioned previously, the correlation coefficient is used to measure the size of the effect and values of ±.10, ±.30 and ±.50 can be interpreted as small, medium and large (Cohen, 1988; Field, 2009; Green & Salkind, 2014).
Then regression analyses were performed to assess whether CDMSE at post-intervention (Time 3) is able to predict career indecision and decision-making difficulties at follow-up (Time 4). In order to investigate whether a predictive or causal relationship exists between CDMSE and career indecision; and between CDMSE and decision-making difficulties, the predictor variable should be measured at an earlier time compared to the outcome variable. In the present study, predictor variables include CDMSE and its subscales measured at Time 3; while outcome variables include career indecision, and decision-making difficulties and their main categories are measured at Time 4.

In addition to correlational and regression analyses, a structural model that includes all three constructs using structural equation modelling (SEM) is presented to analyse the relationships among the three constructs.

9.4 Research question three - What is the relationship between CDMSE and career indecision?

9.4.1 Results from correlation analyses

Pearson's correlational analyses were conducted between the total CDSES-SF

and its subscales, and career indecision. At pre-test (Time 1), career indecision as measured by the CDS was significantly, moderately and negatively correlated with CDSES-SF total and three of the four subscales. The correlation between career indecision and problem-solving was not significant. At post-test (Time 4), CDSES-SF total and all four subscales, and the CDS total scale showed statistically significant, but moderate negative correlations. The total CDSES-SF and CDS pre-test and post-test scores revealed statistically significant but moderate correlations of -.38 and -.39 respectively. See Table 9.1 for the pre-test and post-test bivariate correlations matrix.

Table 9.1

Pre-test and Post-test Bivariate Intercorrelations between CDS and CDSES-SF Total and Subscales Scores (pre-test n = 244; post-test n = 222)

	Pre-Test	1	2	3	4	5	6
1	CDS	1.00					
2	Occupational Information	-.23**	1.00				
3	Problem-solving	**-.12**	.44**	1.00			
4	Goal selection	-.44**	.49**	.37**	1.00		
5	Decision-making	-.30**	.53**	.34**	.53**	1.00	
6	CDSES-SF Total	-.38**	.83**	.62**	.83**	.76**	1.00
	Post-test	1	2	3	4	5	6
1	CDS	1.00					
2	Occupational Information	-.29**	1.00				
3	Problem-solving	-.24**	.61**	1.00			
4	Goal Selection	-.44**	.69**	.59**	1.00		
5	Decision-making	-.35**	.65**	.60**	.69**	1.00	
6	CDSES-SF Total	-.39**	.89**	.78**	.87**	.84**	1.00

**$p < .01$

9.4.2 Results from regression analyses

Multiple regression analyses were conducted in order to examine the indirect and direct effects of CDMSE on career indecision. As the individual's original level of career indecision and CDMSE at Time 2 may indirectly influence the impact of CDMSE at Time 3 on career indecision at Time 4, the potential effects of the individual's original level of career indecision and CDMSE were controlled for in the multiple regression analyses by entering these variables in the first step of a multiple hierarchical regression. The second block of the regression equation, examining direct effects, comprised CDMSE at Time 3. The results of both direct and indirect effects on each multiple hierarchical regression are reported in Table 9.2.

Table 9.2

Regression analyses for CDMSE on Career Indecision

	β	*t*	*p*	*F*	*sig*	R^2	ΔR^2	ΔF	*Sig ΔF*
Step 1:				13.12	< .001				
Career indecision at Time 2	.47	4.98	.000						
CDMSE at Time 2	.05	.53	.597						
Step 2:				10.41	< .001	.24	.03	4.15	.044
CDMSE at Time 3	-.20	-2.04	.044						

Note: Δ = Change

As can be seen from Table 9.2, CDMSE at post-intervention (Time 3) could significantly predict career indecision at follow-up four weeks after the intervention (at Time 4) after controlling for the effects of the individual's original level of career indecision and CDMSE prior to the commencement of

the intervention, F (3, 97) = 10.41, p < .001. The level of CDMSE post-intervention had significant direct effects on the level of career indecision (β = -.20, t = -2.04; p = .044), accounting for 22.00% of the variance of career indecision at Time 4. These results suggest that an increase in overall CDMSE post-intervention is able to predict a decrease in career indecision at follow-up.

Next, multiple regression analyses were conducted with the four subscales of the CDMSE (instead of the total scale) as predictors of career indecision. The results showed that the four subscales in combination did not contribute significantly to the variability of career indecision at Time 4, R^2 change = .07, F (4, 94) = 2.34, p = .061. However, only problem-solving contributed significantly to the prediction of career indecision at Time 4 (β = -.22, t = -2.01; p = .047).

9.5 Research question four - What is the relationship between CDMSE and career decision-making difficulties?

9.5.1 Results from correlation analyses

Pearson's correlation analyses were conducted between the total CDSES-SF and its four subscales, and CDDQr and its three main categories of difficulties. Both at pre-test (Time 1) and post-test (Time 4), scores for CDSES-SF and its four subscales were significantly, moderately and negatively correlated with CDDQr and three of its main categories of difficulties. The total CDSES-SF and CDDQr pre-test and post-test scores revealed statistically significant but

moderate correlations of -.38 and -.46 respectively. See Table 9.3 for the pre-test and post-test bivariate correlations matrix.

Table 9.3

Pre-test and Post-test Bivariate Intercorrelations between CDSES-SF Total and subscales, and CDDQr and main category scores (pre-test n = 244; post-test n = 222)

	Pre-test	1	2	3	4	5	6	7	8	9
1	Occupational information	1.00								
2	Problem-solving	.44**	1.00							
3	Goal Selection	.49**	.37**	1.00						
4	Decision-making	.53**	.34**	.53**	1.00					
5	CDSES-SF total scale	.83**	.62**	.83**	.76**	1.00				
6	Lack of Readiness	-.21**	-.19**	-.27**	-.32**	-.32**	1.00			
7	Lack of Information	-.40**	-.30**	-.51**	-.47**	-.56**	.50**	1.00		
8	Inconsistent information	-.27**	-.19**	-.46**	-.36**	-.43**	.46**	.63**	1.00	
9	CDDQ Total scale	-.38**	-.28**	-.52**	-.48**	-.55**	.70**	.92**	.84**	1.00
	Post-test	1	2	3	4	5	6	7	8	9
1	Occupational information	1.00								
2	Problem-solving	.61**	1.00							
3	Goal Selection	.69**	.59**	1.00						
4	Decision-making	.65**	.60**	.69**	1.00					
5	CDSES-SF total scale	.89**	.78**	.89**	.84**	1.00				
6	Lack of Readiness	-.34**	-.32**	-.37**	-.38**	-.41**	1.00			
7	Lack of Information	-.50**	-.34**	-.56**	-.54**	-.58**	.68**	1.00		
8	Inconsistent information	-.35**	-.31**	-.53**	-.50**	-.50**	.62**	.81**	1.00	
9	CDDQ Total scale	-.46**	-.36**	-.56**	-.54**	-.57**	.81**	.95**	.92**	1.00

**$p < .01$

Pearson's correlational analyses were also conducted between the total CDSES-SF and its four subscales, and the 10 subcategories of difficulties. At pre-test (Time 1), lack of motivation was not significantly correlated with occupational information and problem-solving but was significantly and negatively correlated with the total CDSES-SF scale, goal selection and decision-making. Dysfunctional beliefs were not significantly correlated with the CDSES-SF scales or any of its four subscales, and was not significantly correlated with any other difficulty subcategory. Inconsistent information due to external conflicts are not significantly correlated with problem-solving and decision-making.

All other correlations were significant at p <.01 except for one which is p < .05 between inconsistent information due to external conflicts and occupational information. The four subcategories within lack of information were significantly and negatively correlated with the CDSES-SF scale. Lack of information about the CDM process, and lack of information about self were significantly correlated with goal selection. The size of these correlations can be considered moderate to large (r = -.45 to -.51) according to Cohen (1988).

At post-test (Time 4), correlations between the total CDSES-SF and its four subscales, and the 10 subcategories of difficulties were statistically significant at p < .01 except for dysfunctional beliefs. The dysfunctional beliefs subcategory was not significantly correlated with the total CDSES-SF scale, occupational information, goal selection and decision-making. It was significantly correlated with problem-solving at p < .05.

The size of the correlations for the four subcategories within lack of information, inconsistent information due to unreliable information and internal conflicts, and the total CDSES-SF scales ranged from r = -.46 to -.58, occupational information ranged from r = -.31 to -.49), goal selection ranged from r = -.47 to -.57, and decision-making ranged from r = -.44 to -.54. The size can be considered moderate to large.

In summary, CDMSE was significantly and negatively correlated with decision-making difficulties as measured by the CDDQr and its three main categories at pre-test and post-test. However, an examination of the correlation between the 10 specific difficulty subcategories and the CDSES-SF and its four subscales revealed that three difficulty subcategories were not significantly correlated with the CDSES-SF subscales at pre-test. At post-test, only the dysfunctional beliefs subcategory was not significantly correlated with the total CDSES-SF scale, occupational information, goal selection and decision-making.

9.5.2 Results from regression analyses

Multiple regression analyses were conducted in order to examine the indirect and direct effects of CDMSE on career decision-making difficulties. As the individual's original level of decision-making difficulties and CDMSE at Time 2 may indirectly influence the impact of CDMSE at Time 3 on decision-making difficulties at Time 4, the potential effects of the individual's original level of decision-making difficulties and CDMSE were controlled for in the

multiple regression analyses by entering these variables in the first step of a multiple hierarchical regression. The second block of the regression equation, examining direct effects, comprised CDMSE at Time 3. The results of both direct and indirect effects on each multiple hierarchical regression are reported in Table 9.4.

Table 9.4

Regression analyses for CDMSE on Career Decision-Making Difficulties

	β	*t*	*p*	*F*	*sig*	R^2	ΔR^2	*ΔF*	*Sig ΔF*
Step 1:				16.35	<.001				
Decision-making Difficulties at Time 2	.52	5.41	.000						
CDMSE at Time 2	.05	.51	.611						
Step 2:				15.63	< .001	.33	.08	10.90	.001
CDMSE at Time 3	-.32	-3.30	.001						

Note: Δ = Change

As can be seen from Table 9.4, CDMSE at post-intervention (Time 3) could significantly predict career decision-making difficulties at follow-up four weeks after the intervention (at Time 4) after controlling for the effects of the individual's original level of career decision-making difficulties and CDMSE prior to the commencement of intervention, F (3, 97) = 15.63, $p < .001$. The level of CDMSE post-intervention had significant direct effects on the level of career decision-making difficulties (β = -.32, t = -3.30; p = .001), accounting for 30.50% of the variance of career decision-making difficulties at Time 4.

Next, multiple regression analyses were conducted with the four subscales of the CDMSE (instead of the total scale) as predictors of career decision-making difficulties. The results showed that the four subscales in combination contributed significantly to the variability of decision-making difficulties at Time 4, R^2 change = .10, F (4, 94) = 3.55, p = .010, accounting for 30.70% of the change. However, no single subscale contributed significantly to the variability of decision-making difficulties at Time 4.

9.6 Structural model of the relationship among three constructs

In addition to correlation and regression analyses to examine the relationship among the three constructs, a structural model that includes all three constructs using structural equation modelling (SEM) is presented.

9.6.1 Overview and hypothesis

The primary purpose of using SEM is to address some methodological limitations in previous research, for example, using cross-sectional designs (e.g., Taylor & Popma, 1990, Grier-Reed & Skaar, 2010) in examining the relationships among the three constructs. By collecting data longitudinally across four separate occasions, and using a structural equation modelling approach, the direct influence of CDMSE post-intervention on career indecision and decision-making difficulties at follow-up can be examined. According to Rosenthal and Rosnow (1991), in order to investigate causality, one condition is that data from the independent variable should be collected before the dependent variable. For the purposes of the present study, data on

CDMSE measured at Time 3, and data on career indecision and decision-making difficulties measured at Time 4 are included for analyses, in order to examine the effects of CDMSE on career indecision and decision-making difficulties. One advantage of SEM based on longitudinal data is that it allows the researcher to examine complex relationships involving multiple predictor and outcome variables in one model (Bentler, 1980). In the present study, CDMSE is the predictor variable while career indecision and decision-making difficulties are the outcome variables.

As earlier cross-sectional studies have reported that CDMSE is an important correlate and predictor of career indecision (e.g., Betz & Voyten, 1997, Taylor & Popma, 1990), and that career indecision and decision-making difficulties are highly correlated (e.g., Osipow & Gati, 1998, Amir & Gati, 2006), CDMSE at Time 3 is hypothesised to exert causal influences on career indecision and decision-making difficulties at Time 4 in this model. The proposed causal paths from CDMSE to career indecision and decision-making difficulties would therefore be negative in direction. These paths are represented by single headed arrows from CDMSE to career indecision and decision-making difficulties.

As CDMSE, career indecision and decision-making difficulties are latent constructs, it is important to establish that the measurement of each latent construct is psychometrically sound (Byrne, 2010). Therefore confirmatory factor analysis (CFA) was conducted to test the validity of the indicator variables prior to including them in the structural model (Byrne, 2010). As each instrument consists of many items, a measurement model was developed

and tested for each construct. After CFA was conducted for each construct, a measurement model for all three constructs was developed in order to assess these constructs together. A structural model was then developed to assess the interrelationships between the constructs. According to Byrne (2010), a measurement model that is operating adequately will give one the confidence in the findings related to the assessment of the hypothesised structural model.

9.6.2 Method

9.6.2.1 Participants

The sample included in the analyses consisted of participants in the intervention group that completed the CDSES-SF at Time 3, and the CDS and the CDDQr at Time 4 (n = 101).

9.6.2.2 Instruments

CDMSE was measured by the CDSES-SF (Betz et al., 1996), while career indecision was measured by the Indecision Scale of the CDS by Osipow et al. (1976), and career decision-making difficulties were measured by the CDDQr by Gati and Saka (2001b). A detailed description of these instruments can be found in Section 4.4 and in Chapter six.

9.6.2.3 Statistical analyses

The statistical software AMOS 22 was used to conduct the CFA with Maximum Likelihood Estimation (MLE) to assess the adequacy of the model. Following the guidelines by Hair et al. (2010), three measures of fit were used to evaluate how well the data fit the model: (a) normed chi-square which is the chi-square value divided by the degrees of freedom (χ^2/df), (b) the comparative fit index (CFI), and (c) the root mean square error of approximation (RMSEA). The chi-square statistics are reported but are not used in evaluating goodness of fit because it is affected by model and sample size (Hair et al., 2010). For the normed χ^2, a value smaller than 2 is considered very good and values between 3 and 5 are acceptable (Hair et al., 2010). The CFI statistics range from 0 to 1, and values greater than .90 indicate a good model fit (Byrne, 2010). For RMSEA, a value of .05 or less indicates a good fit although a value of between .05 and .08 indicates a reasonable fit, while a value of .10 or higher indicates a poor fit (Byrne 2010, Hair et al. 2010). These measurement criteria were used to determine model fit in the analyses of the three constructs. The results of the CFA for each latent construct are discussed in turn below. As CFA of the three instruments is not the main focus of the present investigation, only brief details are included.

9.6.3 Results for CFA

(1) CDMSE

The CFA model to be tested in the present application is a second-order CFA

model where CDMSE can be explained by four first-order factors, namely the four subscales of *occupational information, problem-solving, goal selection* and *decision-making*. The 20-item four-factor structure of the CDSES-SF derived from the CFA conducted in Chapter six was used as the model to examine if it fits the data for the intervention group at Time 3. Based on the assessment of fit criteria above, the results indicated that this model did not provide an adequate fit to the data, with χ^2 (166) = 276.16, $p < .001$, normed χ^2 = 1.66, CFI = .87, and RMSEA = .08. Specifically, the CFI indicated that the model was a poor fit. Therefore, items with factor loadings below 0.6 were removed. A total of seven items were deleted – four items were deleted from the *occupational information* subscale; one item was deleted from the *problem-solving* subscale; one item was deleted from the *goal selection* subscale; and one item was deleted from the *decision-making* subscale. The resultant model provided an acceptable fit to the data, with χ^2 (61) = 107.11, $p < .001$, normed χ^2 = 1.76, CFI = .91, and RMSEA = .09. This model was included in the structural model.

(2) Career indecision

As career indecision is considered a one-factor model that is measured by all 16 items in the indecision Scale of the CDS, all 16 items were included in the measurement model. Based on the assessment of fit criteria, the results indicated that the 16-item model of the CDS did not provide an adequate fit to the data, with χ^2 (104) = 174.49, $p < .001$, normed χ^2 = 1.68, CFI = .87, and RMSEA = .08. Specifically, the CFI indicated that it was a poor fit. Therefore, items with factor loading below 0.6 were deleted. A total of eight items were

deleted, and the re-estimated model showed a marginal fit, with χ^2 (20) = 40.86, p = .004, normed χ^2 = 2.04, CFI = .94, and RMSEA = .10. Although the value of the RMSEA indicated a poor fit, the normed χ^2 and the CFI indicated an acceptable fit. As further deletion of items did not improve the fit, this model was included in the structural model, and the marginal model fit was noted and will be discussed later.

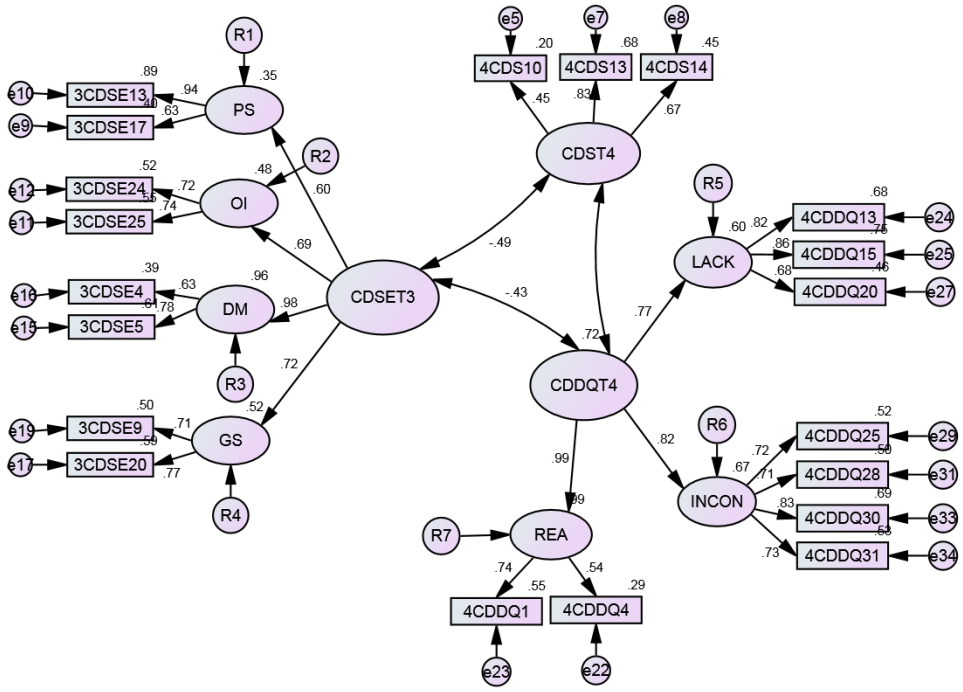
(3) Decision-making difficulties

The CFA model to be tested in the present application is a second-order CFA model where decision-making difficulties can be explained by three first-order factors, namely the three main categories of difficulties related to *lack of readiness*, *lack of information*, and *inconsistent information*. This three-factor structure of the CDDQr was used as the model to assess if it fits the data. Based on the assessment of fit criteria, the results indicated that this model did not provide an adequate fit to the data, with χ^2 (461) = 1,035.29, p < .001, normed χ^2 =2.22, CFI = .71, and RMSEA = .11. Therefore, items with factor loading below 0.6 were deleted. However, the model after the deletion of items with low factor loading did not provide an adequate fit to the data. Therefore, the model was re-estimated by deleting items that had large modification indices/standardised residuals. Items that had large modification indices were deleted one at a time until a model that met the assessment of fit criteria emerged (Byrne, 2010). A total of 18 items were eventually deleted and the resultant model provided an adequate fit to the data, with χ^2 (74) = 119.76, p = .001, normed χ^2 =1.62, CFI = .94, and RMSEA = .08. This model was therefore included in the structural model.

9.6.4 Results for the measurement model

According to Byrne (2010), an important preliminary step in the analysis of a structural model is to test the validity of the measurement model. Accordingly, all three constructs were combined in a measurement model. Based on the assessment of fit criteria, this model did not provide a good fit to the data, with χ^2 (550) = 833.21, $p < .001$, normed χ^2 = 1.52, CFI = .85, and RMSEA = .07. Therefore, the model was re-estimated by deleting items that had large modification indices/standardised residuals. Items that had large modification indices were deleted one at a time until a model that met the assessment of fit criteria emerged (Byrne, 2010). A total of 15 items were deleted (5 items from each instrument) and the resultant model provided a good fit to the data, with χ^2 (163) = 244.35, p = .001, normed χ^2 =1.50, CFI = .91, and RMSEA = .07.

From the measurement model, as expected, CDMSE at Time 3 is moderately and negatively correlated with career indecision (-.49) and decision-making difficulties (-.43) at Time 4. Career indecision and decision-making difficulties at Time 4 are strongly and positively correlated (.72). See Figure 9.1 for the standardised estimates of the pooled measurement model of the three constructs.



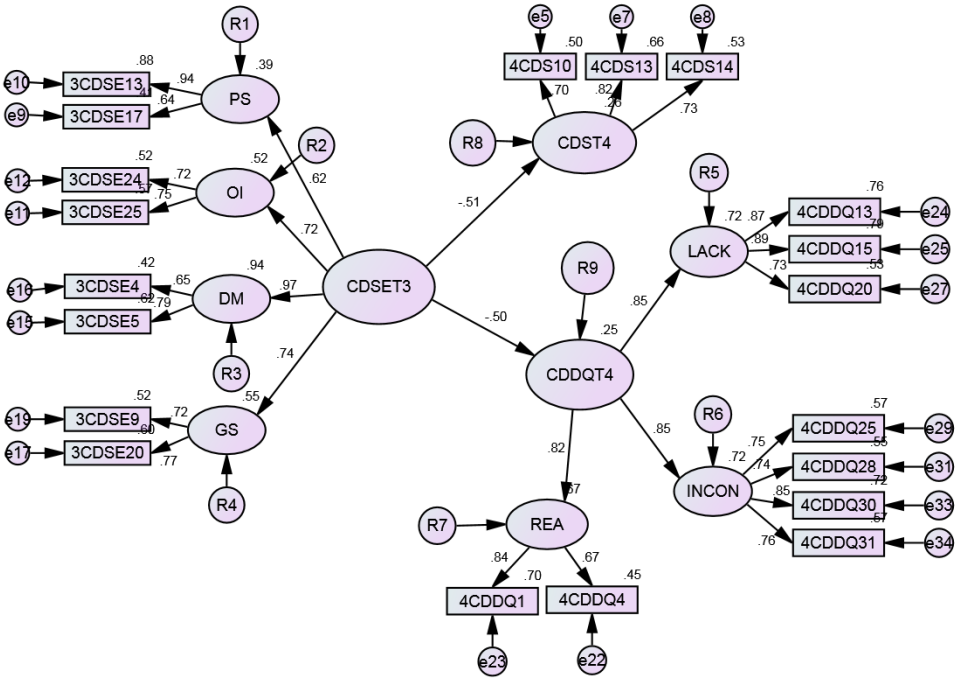
CDSET3 = CDMSE at Time 3; CDST4 = Career indecision at Time 4; CDDQT4 = Decision-making difficulties at Time 4; PS = Problem-solving; OI = Occupational Information; GS = Goal Selection; DM = Decision-making; REA = Difficulties related to Readiness; LACK= Difficulties related to Lack of Information; INCON = Difficulties related Inconsistent Information.

Figure 9.1. Measurement model of CDMSE, career indecision and decision-making difficulties.

9.6.5 Results for the structural model

As CDMSE at Time 3 is hypothesised to exert causal influences on career indecision and decision-making difficulties at Time 4 in this model, single-headed arrows point out from CDMSE to career indecision and decision-making difficulties. In addition, the proposed causal paths from CDMSE to career indecision and decision-making difficulties would be negative in direction indicating that an increase in CDMSE at Time 3 would cause a

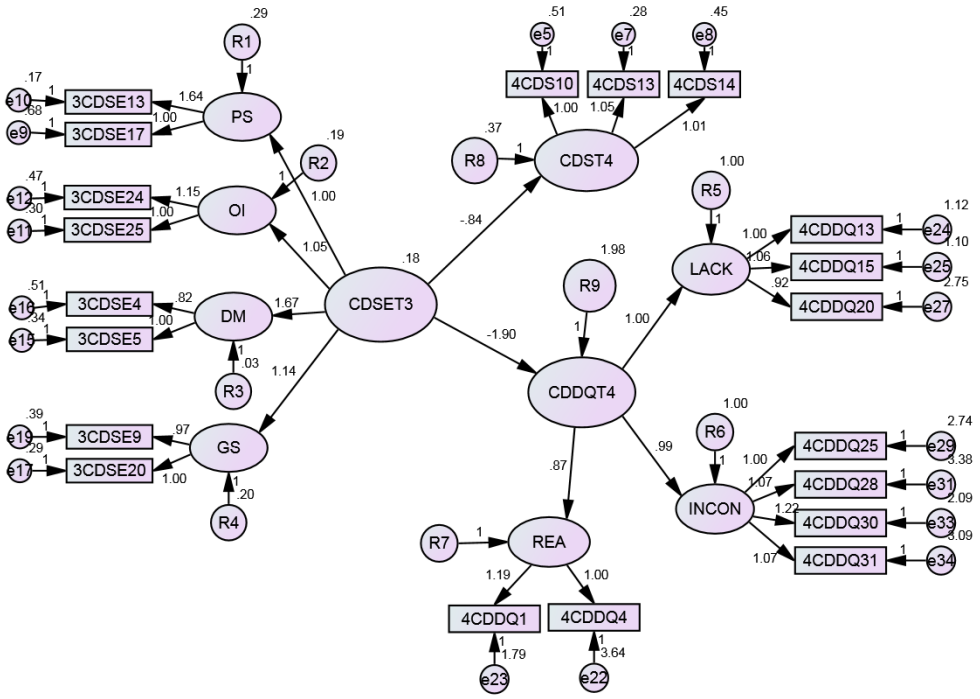
decrease in career indecision and decision-making difficulties in Time 4. Based on the assessment of fit criteria, this model provided an acceptable fit to the data, with χ^2 (163) = 233.09, $p < .001$, normed $\chi^2 = 1.43$, CFI = .92, and RMSEA = .07. Figure 9.2 presents the standardised estimates of a structural model that consists of the three constructs.



CDSET3 = CDMSE at Time 3; CDST4 = Career indecision at Time 4; CDDQT4 = Decision-making difficulties at Time 4; PS = Problem-solving; OI = Occupational Information; GS = Goal Selection; DM = Decision-making; REA = Difficulties related to Readiness; LACK= Difficulties related to Lack of Information; INCON = Difficulties related Inconsistent Information.

Figure 9.2. Standardised structural model of CDMSE, career indecision and decision-making difficulties.

Parameter estimates can be obtained from unstandardized estimates as displayed in Figure 9.3 and Table 9.5 below.



CDSET3 = CDMSE at Time 3; CDST4 = Career indecision at Time 4; CDDQT4 = Decision-making difficulties at Time 4; PS = Problem-solving; OI = Occupational Information; GS = Goal Selection; DM = Decision-making; REA = Difficulties related to Readiness; LACK= Difficulties related to Lack of Information; INCON = Difficulties related Inconsistent Information.

Figure 9.3. Unstandardised structural model of CDMSE, career indecision and decision-making difficulties.

Table 9.5

Regression path coefficients and their significance

Construct		Construct	Estimate	S.E.	C.R.	*p*	Result
CDDQT4	<---	CDSET3	-1.90	.67	-2.82	.005	Significant
CDST4	<---	CDSET3	-.84	.30	-2.81	.005	Significant

Note: S.E. = Standard Error; C.R. = Critical Ratio

Based on the regression path coefficients and their significance, these findings suggest that CDMSE at Time 3 has significant causal effects on career indecision and decision-making at Time 4. As indicated in the model, when CDMSE at Time 3 goes up by 1 unit, decision-making difficulties at Time 4 go

down by 1.90 units whereas career indecision at Time 4 goes down by 0.84 units. The results also show that the level of CDMSE at Time 3 had a slightly greater impact on career indecision compared to decision-making difficulties but the difference is minimal.

Table 9.6

Standardized regression weights

Construct		Construct	Estimate
CDDQT4	<---	CDSE_T3	-.50
CDST4	<---	CDSE_T3	-.51

From the standardised regression weights in Table 9.6, it can be seen that when CDMSE at Time 3 goes up by 1 standard deviation, decision-making difficulties at Time 4 go down by 0.50 standard deviation. Meanwhile, when CDMSE at Time 3 goes up by 1 standard deviation, career indecision at Time 4 goes down 0.51 standard deviation.

The squared multiple correlation or coefficient of determination shows how much of the total variance is explained by the predictor variables. In this case, 25.00% of the variance of decision-making difficulties at Time 4 can be explained by CDMSE at Time 3. Similarly, 26.3% of the variance of career indecision at Time 4 can be explained by CDMSE at Time 3. The amount of variance explained by the predictor variable is considered medium to large (Cohen, 1992).

9.6.6 Discussion of findings for the structural model

The goal of the present investigation was to evaluate the effects of CDMSE on

career indecision and decision-making difficulties using longitudinal data via SEM. As SEM takes a confirmatory rather than an exploratory approach, the pattern of interrelationships among constructs needs to be specified a priori (Byrne, 2010). Therefore, it was hypothesised that as participants in the intervention group developed increased CDMSE (i.e., greater confidence in carrying out tasks specific to making career decisions), their level of career indecision and decision-making difficulties would be reduced. As predicted, CDMSE at Time 3 exerts a significant causal effect on decision-making difficulties and career indecision at Time 4. Moreover, CDMSE at Time 3 appears to have a slightly bigger impact on career indecision compared to decision-making difficulties. These findings have important implications for the design and development of interventions to help students who are undecided or who have decision-making difficulties. This will be discussed in detail in chapter 11.

The findings of the present investigation need to be evaluated in the light of a few limitations. Firstly, the sample size for conducting CFA should be much larger than the sample available for the present study. According to Hu, Bentler and Kano (1992), a sample size of 500 cases is desirable for using MLE. The small sample size (n = 101) used could have impacted the results for model fit for the three instruments, especially in the measurement of career indecision. The marginal model fit for career indecision could have also impacted the model fit for the pooled measurement model and the structural model. Therefore the findings of this investigation should be considered as exploratory in nature and further research with larger sample sizes is needed to verify the

causal relationship between CDMSE and career indecision, and decision-making difficulties.

Secondly, other variables that may mediate the relationship between CDMSE and career indecision, and decision-making difficulties, such as academic achievement and social economic status were not explored. It may be possible that there are other variables that could explain the relationship between CDMSE and career indecision, and between CDMSE and decision-making. Future studies should explore if there are other variables that may influence or explain these relationships.

9.7 Discussion of overall findings

This chapter addresses the third and fourth research questions regarding the relationship between CDMSE and career indecision, and between CDMSE and career decision-making difficulties as assessed by the main instruments.

To explore the relationship between CDMSE and career indecision, correlation and regression analyses were conducted. It was hypothesised that students' increased CDMSE at post-intervention is able to predict a decrease in career indecision at the follow-up four weeks later. Correlation analyses revealed that CDMSE was significantly and negatively correlated with career indecision. Regression analyses revealed that the level of CDMSE post-intervention was able to significantly predict decreased levels of career indecision at follow-up four weeks after the intervention. Thus, the hypothesis was supported. While these findings appear to contradict those of Creed et al., 2006 (who proposed

that these two constructs should be viewed as distinct constructs), and Grier-Reed and Skaar (2010) who did not find a corresponding decrease in career indecision despite an increase in CDMSE post-intervention, they are consistent with the findings of Taylor and Popma, 1990; Betz and Voyten, 1997, and Guay et al., 2003. A primary strength of the present study is its longitudinal design that enabled the examination of the relationship between these two constructs over time more accurately.

The results of correlation analyses showed that CDMSE and decision-making difficulties are significantly related, consistent with findings by Osipow and Gati (1998) and Amir and Gati (2006). Regression analyses revealed that the level of CDMSE post-intervention was able to predict decreasing levels of career decision-making difficulties at follow-up four weeks after the intervention. Thus the hypothesis proposed was also supported.

It also appears that participants' CDMSE post-intervention had larger effects on decision-making difficulties compared to career indecision. The level of CDMSE post-intervention contributed to 30.50% of the variance in decision-making difficulties compared to 22.20% of the variance in career indecision at follow-up.

These findings were corroborated by findings of SEM in assessing the relationships among the three constructs. Using CDMSE at Time 3 as the predictor variable, and career indecision and decision-making difficulties at Time 4 as outcome variables, a structural model was developed to assess the

hypothesised causal relationship between CDMSE and career indecision; and between CDMSE and decision-making difficulties. As predicted, the results show that CDMSE at Time 3 exerts a causal effect on career indecision and decision-making difficulties at Time 4, with CDMSE having a greater impact on career indecision compared to decision-making difficulties. However, these findings need to be interpreted in view of several limitations, one of which is the small sample size which may have impacted the results for model fit. Therefore, these results should be considered as exploratory and further research is needed to confirm them. Despite this limitation, this investigation has initiated an examination of the relationships among the three constructs in a longitudinal research design using SEM which, to my knowledge, has not been done previously.

These findings represent a significant contribution to intervention research because most studies in this area are correlational or cross-sectional in nature, and do not include a follow-up measurement time point post-intervention. The findings of the present study showed that by increasing CDMSE through carefully designed career courses, career indecision and decision-making difficulties would also be reduced. These findings also lend empirical support to social cognitive models, such as the SCCT, in describing the career decision-making process. Within the SCCT, self-efficacy is presumed to be a direct causal antecedent to behavioural outcomes (i.e., career indecision and decision-making difficulties). According to Lent et al. (1996), personal attributes interact with contextual factors and learning experiences to influence self-efficacy beliefs and outcome expectations, which in turn shape our interests,

goals, actions and ultimately attainments. Therefore, it follows that modifying CDMSE will have an impact on career indecision and decision-making difficulties.

9.8 Chapter summary and conclusions

This chapter presented the statistical analyses of data in order to answer the third and fourth research questions on the relationship between CDMSE and career indecision, and between CDMSE and career decision-making difficulties.

Overall, the findings reveal that the increased level of CDMSE at post-intervention was able to predict decreased levels of career indecision and decision-making difficulties at follow-up four weeks post-intervention. As there is a paucity in intervention research that investigates the relationships among CDMSE, career indecision and decision-making difficulties, these findings represent a significant advance in our understanding of how these constructs affect one another. These findings have important implications for the design and development of suitable interventions to help students make career decisions. More in-depth discussion concerning the implications of these findings will be presented in Chapter 11.

The next chapter addresses research question five concerning gender in career decision-making.

CHAPTER 10 – GENDER AND CAREER DECISION-MAKING

10.1 Chapter overview

This chapter details the statistical analyses of data in order to address research question five concerning gender and career decision-making. It begins with a brief background of the area being investigated, followed by a description of and justification for the statistical methods chosen to analyse the data, and continues with the presentation of the results of the analyses. This is then followed by a discussion of the findings. This chapter concludes with a summary of the key points.

10.2 Gender and career decision-making

Research on gender in career decision-making has yielded mixed findings. In the area of CDMSE, some researchers have found minimal or no differences in CDMSE between male and female students in school and college (e.g., Chung 2002, Creed et al., 2006; Luzzo & Ward, 1995; Taylor & Popma, 1990; Taylor & Betz 1983, Grier-Reed & Skaar, 2010), while others reported significant differences between male and female students (e.g., Betz & Hackett, 1981; Mau, 2000).

In the area of career indecision, some researchers reported no link between gender and career indecision (Neice & Bradley, 1979; Lunneborg, 1975; Osipow, 1990; Taylor & Popma, 1990), but others such as Gianakos (1995) and Gati et al. (1995) proposed that gender affects career decisions in the

alternatives considered and in eventual choices. Mau (2000) suggests that the effects of gender on career indecision are more apparent in collectivist cultures where female students are not given adequate opportunities to make career decisions.

In research on career decision-making difficulties, Gati et al. (1996) found no gender differences in their sample of American and Israeli students. However, when comparing British and Chinese international students studying in two British universities, Zhou and Santos (2007) reported gender differences among British participants while there were no significant gender differences among Chinese participants.

In studies investigating career interventions, Scott and Ciani (2008) found that female students reported significantly greater intervention gains in CDMSE compared to male students thereby showing that female and male students responded differently to the intervention. However, in examining two career courses for college students in Taiwan, Peng (2001) found that gender was not a main factor in determining intervention effects.

The overall mixed findings regarding gender in career decision-making suggest that more research is necessary to understand if male and female students perceive CDMSE, career indecision and decision-making difficulties differently as this has important implications for the design and development of interventions aimed at increasing CDMSE, and in reducing career indecision, and decision-making difficulties.

The purpose of this investigation is to find out if male and female students perceive CDMSE, career indecision and decision-making difficulties differently as measured by the three instruments prior to the intervention, and if they respond differently to the career intervention. Although it was predicted that gender will have an impact on the three constructs examined prior to and after the intervention, a specific hypothesis concerning the amount of change by gender on any of the three constructs was not advanced.

10.3 Statistical methods used to analyse data

In order to investigate perceived CDMSE, career indecision and decision-making difficulties among male and female students, data were analysed on two levels. Firstly, data were split into intervention and comparison groups and analysed separately with gender as the between-subject factor using mixed ANOVA. This was to determine if there were interactions between time and gender in each group on the three constructs as measured using the CDS, total CDSES-SF and its subscales, and total CDDQr, and its main and subcategories. Univariate analyses were conducted to examine mean differences between scores for male and female students at Time 1 and Time 4. This was to determine if there were significant differences between male and female students in both groups at the two time points. Then repeated measures ANOVA was conducted to determine if the change in scores were significantly different between the two time points for both male and female students. Pairwise comparisons with a Bonferroni adjustment were used to ascertain if the change in scores at the two time points were significant (Maxwell &

Delaney, 2004). Results from the comparison group provided a check and comparison with the results from the intervention group.

Secondly, repeated measures ANOVA was conducted with gender as a between-subject factor on the three constructs as measured using the CDS, total CDSES-SF and its subscales, and total CDDQr, and its main and subcategories for the intervention group only. This was to determine if there were interactions between time and gender on the three constructs. Univariate analyses were conducted to examine mean differences between scores for male and female students at the four time points. This was to determine if there were significant differences between male and female students at the four time points. Pairwise comparisons with a Bonferroni adjustment were used to ascertain if the change in scores for male and female students between Time 2 and Time 3 were significant (Maxwell & Delaney, 2004). This was to determine if male and female students responded differently to the intervention.

The results on the impact of gender on each construct will be discussed in turn below.

10.4 Results

10.4.1 CDMSE and gender

10.4.1.1 Results from comparing intervention and comparison groups

Results from mixed ANOVA showed that the interactions between time and gender on CDMSE as measured by the total CDSES-SF scale for both intervention and comparison groups were not significant (intervention group, F (1, 99) = .73, p = .395, partial η^2 = .01; comparison group, F (1, 119) = .59, p = .443, partial η^2 = .01). Follow-up univariate tests revealed that mean CDMSE scores for male and female students for both groups were not significantly different at Time 1 or Time 4. Pairwise comparisons revealed that CDMSE decreased significantly for both male and female students in the intervention group (p < .001). Although there was a decrease in CDMSE for male students in the comparison group between Time 1 and Time 4, the decrease was not significant (p = .075).

Analyses were also conducted for the four subscales of the CDSES-SF and the results are presented below.

(1) Occupational informational

The interactions between time and gender on self-efficacy related to gathering occupational information for both intervention and comparison groups were not significant (intervention group, F (1, 99) = 2.15, p = .145, partial η^2 = .02; comparison group, F (1, 119) = 0.02, p = .887, partial η^2 = .00). Follow-up univariate tests revealed that mean scores for male and female students for both groups were not significantly different at Time 1 or Time 4. Pairwise comparisons revealed that self-efficacy related to gathering occupational information decreased significantly for both male (p = .020) and female students (p = .001) in the comparison group between Time 1 and Time 4.

However, self-efficacy related to gathering occupational information increased significantly for both male ($p = .004$) and female students ($p < .001$) in the intervention group.

(2) Problem-solving

The interactions between time and gender on self-efficacy related to problem-solving for both intervention and comparison groups were not significant (intervention group, F (1, 99) = 1.23, $p = .270$, partial $\eta^2 = .01$; comparison group, F (1, 119) = 0.05, $p = .833$, partial $\eta^2 = .00$). Follow-up univariate tests revealed that mean scores for male and female students for the comparison group were not significantly different at Time 1 or Time 4. However, mean scores for male and female students for the intervention group were significantly different at Time 1, F (1, 121) = 5.59, $p = .020$. At Time 4, however, there were no significant differences between mean scores for female and male students. Pairwise comparisons revealed that self-efficacy related to problem-solving increased significantly for both male ($p = .003$) and female students ($p < .001$) in the intervention group between Time 1 and Time 4. However, differences in scores for male and female students in the comparison group were not significant.

(3) Goal selection

The interactions between time and gender on self-efficacy related to goal selection for both intervention and comparison groups were not significant (intervention group, F (1, 99) = 0.00, $p = .933$, partial $\eta^2 = .00$; comparison group, F (1, 119) = 2.55, $p = .113$, partial $\eta^2 = .02$). Follow-up univariate tests

revealed that mean scores for male and female students were significantly different at Time 1 for the comparison group (p = .049). However, the difference was not significant at Time 4 (p = .516). Mean scores for male and female students in the intervention group were not significantly different at Time 1 or Time 4. Pairwise comparisons revealed that self-efficacy related to goal selection decreased significantly for both male and female students (p < .001) in the intervention group between Time 1 and Time 4. However, changes to self-efficacy related to problem-solving for male and female students in the comparison group were not significant (male, p = .411; female, p = .133).

(4) Decision-making

The interactions between time and gender on self-efficacy related to decision-making for both intervention and comparison groups were not significant (intervention group, F (1, 99) = 0.02, p = .903, partial η^2 = .00; comparison group, F (1, 119) = 0.40, p = .527, partial η^2 = .00). Follow-up univariate tests revealed that mean scores for male and female students for both groups were not significantly different at Time 1 or Time 4. Pairwise comparisons revealed that self-efficacy related to decision-making increased significantly for both male (p = .002) and female students (p < .001) in the intervention group between Time 1 and Time 4. However, differences in scores for male and female students in the comparison group were not significant (male, p = .175; female, p = .566).

Mean scores for male and female students for CDMSE as measured by CDSES-SF and its various subscales, and F-test of significance for both groups

at Time 1 and Time 4, are shown in Table 10.1.

In summary, no significant interactions were found between time and gender on CDMSE as measured by the total CDSES-SF scale or its four subscales for both intervention and comparison groups. Means scores between male and female students were not significantly different at Time 1 for both groups except for self-efficacy related to problem-solving for the intervention group. However, at Time 4, there was no significant difference in both groups. Both male and female students showed significant increases in CDMSE post-intervention at Time 4. However, changes in the comparison group for both male and female students were not significant except for gathering occupational information where both male and female students showed significant increases.

10.4.1.2 Results from intervention group only

The assumption of sphericity was violated, as assessed by Mauchly's test of sphericity, $p < .001$. Therefore, a Greenhouse-Geisser correction was applied ($\varepsilon = 0.85$) to correct the one-way repeated measures ANOVA (Maxwell & Delaney, 2004). Results from repeated measures ANOVA showed that the interactions between time and gender on CDMSE as measured by the total CDSES-SF scale were not significant, F (2.54, 251.37) = .63, p = .569, partial η^2 = .01. Follow-up univariate tests revealed that mean CDMSE scores for male and female students were not significantly different at all four time points. Pairwise comparisons revealed that although CDMSE increased

significantly for both male and female students in the intervention group, with male students recording a higher mean difference (0.69, 95% CI (0.49, 0.88), $p < .001$) compared to female students, (0.62, 95% CI (0.48, 0.75), $p < .001$), the difference was not significant. Analyses were also conducted for the four subscales of the CDSES-SF and the results are presented below.

(1) Occupational information

The assumption of sphericity was violated, as assessed by Mauchly's test of sphericity, $p < .001$. Therefore, a Greenhouse-Geisser correction was applied ($\varepsilon = 0.86$) to correct the one-way repeated measures ANOVA (Maxwell & Delaney, 2004). Results from repeated measures ANOVA showed that the interaction between time and gender on self-efficacy related to occupational information was not significant, F (2.56, 253.85) = .82, $p = .469$, partial $\eta^2 = .01$. Follow-up univariate tests revealed that mean scores for male and female students were not significantly different at all four time points. Pairwise comparisons revealed that self-efficacy related to occupational information increased significantly for both male and female students. The mean difference for male students was 0.54, 95% CI (0.32, 0.75), $p < .001$, and for female students, it was 0.53, 95% CI (0.38, 0.69), $p < .001$).

(2) Problem-solving

The assumption of sphericity was violated, as assessed by Mauchly's test of sphericity, $p = .001$. Therefore, a Greenhouse-Geisser correction was applied ($\varepsilon = 0.87$) to correct the one-way repeated measures ANOVA (Maxwell & Delaney, 2004). Results from repeated measures ANOVA showed that the

interaction between time and gender on problem-solving was not significant, F (2.60, 257.12) = .82, p = .469, partial η^2 = .01. Follow-up univariate tests revealed that mean scores for male and female students were significantly different at Time 1 only (p = .030). Pairwise comparisons revealed that self-efficacy related to problem-solving increased significantly for both male and female students in the intervention group. The mean difference for female students (0.75, 95% CI (0.49, 1.01), p < .001) was greater than male students, 0.56, 95% CI (0.30, 0.82), p < .001.

(3) Goal selection

The assumption of sphericity was violated, as assessed by Mauchly's test of sphericity, p = .001. Therefore, a Greenhouse-Geisser correction was applied (ε = 0.82) to correct the one-way repeated measures ANOVA (Maxwell & Delaney, 2004). Results from repeated measures ANOVA showed that the interaction between time and gender on self-efficacy related to goal selection was not significant, F (2.45, 242.84) = .58, p = .594, partial η^2 = .01. Follow-up univariate tests revealed that mean scores for male and female students were not significantly different at all four time points. Pairwise comparisons revealed that self-efficacy related to goal selection increased significantly for both male and female students. The mean difference for male students (0.89, 95% CI (0.59, 1.19), p < .001) was greater than female students, (0.75, 95% CI (0.58, 0.91), p < .001).

(4) Decision-making

The assumption of sphericity was violated, as assessed by Mauchly's test of

sphericity, $p = .001$. Therefore, a Greenhouse-Geisser correction was applied ($\varepsilon = 0.87$) to correct the one-way repeated measures ANOVA (Maxwell & Delaney, 2004). Results from repeated measures ANOVA showed that the interactions between time and gender on self-efficacy related to decision-making was not significant, F (2.61, 258.08) = 1.29, $p = .279$, partial $\eta^2 = .01$. Follow-up univariate tests revealed that mean scores for male and female students were not significantly different at all four time points. Pairwise comparisons revealed that self-efficacy related to decision-making increased significantly for both male and female students in the intervention group. The mean difference for male students (0.73, 95% CI (0.44, 1.00), $p < .001$) was greater than female students, (0.46, 95% CI (0.29, 0.64), $p < .001$).

In summary, there were no significant interactions between gender and time on CDMSE as measured by the total CDSES-SF scale and its four subscales. Except for the problem-solving subscale that recorded significantly higher mean scores for male students compared to female student at Time 1, male and female students were not significantly different at all other time points and for other subscales. Male students recorded slightly higher intervention effects for goal selection and decision-making, while female students recorded slightly higher intervention effects for problem-solving. Overall, male students recorded slightly higher intervention effects compared to female students.

10.4.2 Career indecision and gender

10.4.2.1 Results from comparing intervention and comparison groups

Results from mixed ANOVA showed that the interactions between time and gender on career indecision as measured by the CDS for both intervention and comparison groups were not significant (intervention group, F (1, 99) = .30, p = .583, partial η^2 = .00; comparison group, F (1, 119) = .33, p = .566, partial η^2 = .00). Follow-up univariate tests revealed that mean scores for male and female students for both groups were not significantly different at Time 1 or Time 4. Pairwise comparisons revealed that career indecision decreased significantly for both male and female students in the intervention group (p < .001). Although there was a decrease in career indecision for female students in the comparison group between Time 1 and Time 4, the decrease was not significant (p = .319). Mean scores for male and female students for career indecision at Time 1 and Time 4 for both groups, and F-test of significance are shown in Table 10.1.

Table 10.1

Mean scores for male and female students for intervention and comparison groups, and F-test of significance at Time 1 and Time 4.

			Time 1			Time 4		
Instrument	Group	Gender	*M*	*SD*	*p*	*M*	*SD*	*p*
CDS	Comparison	Male	2.27	0.58	.152	2.27	0.62	.332
		Female	2.43	0.59		2.37	0.56	
	Intervention	Male	2.57	0.47	.946	2.12	0.52	.474
		Female	2.41	0.51		2.03	0.61	
Total CDSES-SF	Comparison	Male	3.41	0.63	.114	3.30	0.57	.341
		Female	3.24	0.54		3.20	0.61	
	Intervention	Male	3.32	0.47	.143	3.74	0.54	.977
		Female	3.20	0.60		3.73	0.58	
Occupational information	Comparison	Male	3.55	0.72	.485	3.35	0.66	.405
		Female	3.46	0.66		3.25	0.67	
	Intervention	Male	3.50	0.55	.420	3.73	0.51	.436
		Female	3.39	0.62		3.83	0.61	

(continued)

Table 10. 1 (continued)

Instrument	Group	Gender	Time 1			Time 4		
			M	*SD*	*p*	*M*	*SD*	*p*
Problem-solving	Comparison	Male	2.94	0.80	.447	2.96	0.69	.313
		Female	2.83	0.75		2.82	0.79	
	Intervention	Male	3.09	0.74	**.020**	3.57	0.81	.466
		Female	2.70	0.84		3.43	0.93	
Goal selection	Comparison	Male	3.48	0.78	**.049**	3.39	0.75	.516
		Female	3.20	0.75		3.31	0.69	
	Intervention	Male	3.20	0.81	.313	3.83	0.66	.624
		Female	3.12	0.90		3.76	0.67	
Decision-making	Comparison	Male	3.43	0.80	.157	3.30	0.68	.425
		Female	3.23	0.67		3.19	0.79	
	Intervention	Male	3.50	0.55	.424	3.73	0.51	.881
		Female	3.39	0.62		3.83	0.61	

Note. Significant *p*-values are highlighted in bold indicating significant difference in scores between male and female students.

10.4.2.2 Results from intervention group only

The assumption of sphericity was violated, as assessed by Mauchly's test of sphericity, $p < .001$. Therefore, a Greenhouse-Geisser correction was applied ($\varepsilon = 0.83$) to correct the one-way repeated measures ANOVA (Maxwell & Delaney, 2004). Results from repeated measures ANOVA showed that the interaction between time and gender on career indecision was not significant, $F(2.50, 247.10) = .55$, $p = .614$, partial $\eta^2 = .01$. Follow-up univariate tests revealed that mean scores for male and female students were significantly different at Time 2 ($p = .049$). Male students have significantly higher career indecision compared to female students prior to the intervention. However, at Time 3 after the intervention, the differences between male and female students were not significant. Pairwise comparisons revealed that career indecision decreased significantly for both male and female students in the intervention group. The mean difference for male students (0.38, 95% CI (0.14, 0.61), *p* =

.003) was slightly greater than for female students, (0.25, 95% CI (0.13, 0.37), $p < .001$).

10.4.3 Career decision-making difficulties and gender

10.4.3.1 Results from comparing intervention and comparison groups

Results from mixed ANOVA showed that the interactions between time and gender on career decision-making as measured by the CDDQr for both intervention and comparison groups were not significant (intervention group, F (1, 99) = 1.04, $p = .311$, partial $\eta^2 = .01$; comparison group, F (1, 119) = 2.08, $p = .152$, partial $\eta^2 = .02$). Follow-up univariate tests revealed that mean scores for male and female students for both groups were not significantly different at Time 1 or Time 4. Pairwise comparisons revealed that decision-making difficulties decreased significantly for both male and female students in the intervention group ($p < .001$). Although there was a decrease in career indecision for female students in the comparison group between Time 1 and Time 4, the decrease was not significant ($p = .211$).

Gender was also examined as it relates to the main and subcategories of difficulties and the results are presented below.

(1) Lack of readiness

The interactions between time and gender on difficulties due to lack of readiness for both intervention and comparison groups were not significant

(intervention group, F (1, 99) = 0.01, p = .974, partial η^2 = .00; comparison group, F (1, 119) = 0.09, p = .767, partial η^2 = .00). Follow-up univariate tests revealed that mean scores for male and female students for both groups were not significantly different at Time 1 or Time 4. Pairwise comparisons revealed that decision-making difficulties decreased significantly for both male (p = .005) and female students in the intervention group (p < .001). Although there was an increase in lack of readiness for female students in the comparison group between Time 1 and Time 4, the increase was not significant (p = .508).

(2) Lack of information

The interaction between time and gender on difficulties due to the lack of information for the comparison group was significant, F (1, 119) = 5.77, p = .018, partial η^2 = .05. However, the interaction between time and gender on difficulties due to the lack of information for the intervention group was not significant, F (1, 99) = 2.29, p = .133, partial η^2 = .02. Follow-up univariate tests revealed that mean scores for male and female students were significantly different for the comparison group at Time 1 only, F (1, 119) = 5.93, p = .016. Difficulties due to the lack of information were significantly higher for female students. However, the mean scores for both male and female students were not significantly different at Time 4 (p = .666). Mean scores for male and female students for the intervention group were not significantly different at Time 1 or Time 4. Pairwise comparisons revealed that difficulties due to the lack of information decreased significantly for female students in the comparison group (a mean difference of 0.57, 95% CI (0.18, 0.97), p = .005), while the change in scores for male students was not significant (p = .487). Difficulties

due to the lack of information decreased significantly for both male and female students in the intervention group ($p < .001$).

(3) Inconsistent information

The interactions between time and gender on difficulties due to inconsistent information for both intervention and comparison groups were not significant (intervention group, F (1, 99) = 0.16, p = .689, partial η^2 = .00; comparison group, F (1, 119) = 0.27, p = .601, partial η^2 = .00). Follow-up univariate tests revealed that mean scores for male and female students for both groups were not significantly different at Time 1 or Time 4. Pairwise comparisons revealed that difficulties related to inconsistent information decreased significantly for both male ($p < .001$) and female students in the intervention group ($p < .001$). Although there was a slight increase in difficulties due to inconsistent information for both male and female students in the comparison group between Time 1 and Time 4, the increase was not significant (male, p = .183; female, p = .693).

(4) Ten subcategories of difficulties

The interactions between time and gender on the 10 difficulty subcategories were not significant for both intervention and comparison group except for difficulties due to lack of information about self for the comparison group F (1, 119) = 4.14, p = .044, partial η^2 = .03. Follow-up univariate tests revealed that mean scores for male and female students for both groups were not significantly different at Time 1, except for lack of motivation for the intervention group, p = .023, lack of information about the CDM process for

the comparison group, $p = .024$, lack of information about self for the comparison group, $p = .017$, lack of information about additional ways of obtaining information for the comparison group, $p = .037$, and unreliable information for the intervention group, $p = .023$. However, no significant differences were found for male and female students for both groups at Time 4.

Difficulties due to lack of motivation increased significantly for both male and female students for the comparison group but decreased significantly for male students in the intervention group. Although difficulties due to lack of motivation also decreased for female students in the intervention group, the decrease was not significant ($p = .684$). Female students in the comparison group reported significant decreases in difficulties due to lack of information about the CDM process and lack of information about self. For the intervention group, however, both female and male students recorded significant decreases in all subcategories except for difficulties due to lack of motivation.

Mean scores for male and female students for career decision-making difficulties as measured by the CDDQr and the main and subcategories at Time 1 and Time 4 for both groups, and significance of *F*-test are shown in Table 10.2.

Table 10.2

Mean scores for male and female students for intervention and comparison groups, and F-test of significance at Time 1 and Time 4.

			Time 1			Time 4		
Instrument	Group	Gender	*M*	*SD*	*p*	*M*	*SD*	*p*
Readiness	Comparison	Male	5.07	1.10	.634	5.09	1.33	.867
		Female	4.97	1.10		5.05	1.12	
	Intervention	Male	5.23	0.97	.986	4.56	1.04	.483
		Female	5.04	1.02		4.39	1.21	
Lack of motivation	Comparison	Male	3.88	2.03	.119	4.51	1.73	.121
		Female	3.37	1.53		4.00	1.77	
	Intervention	Male	4.24	1.49	**.023**	3.68	1.52	.097
		Female	3.15	1.53		3.06	1.80	
General indecisiveness	Comparison	Male	6.27	1.55	.107	6.09	1.87	.508
		Female	6.75	1.60		6.31	1.73	
	Intervention	Male	6.20	1.61	.056	5.57	1.82	.776
		Female	6.53	1.83		5.69	1.91	
Dysfunctional beliefs	Comparison	Male	5.07	1.54	.465	4.78	1.55	.663
		Female	4.85	1.66		4.91	1.49	
	Intervention	Male	5.23	1.54	.907	4.48	1.57	.864
		Female	5.34	1.57		4.41	1.84	
Lack of information	Comparison	Male	4.81	2.08	**.016**	4.96	2.13	.666
		Female	5.69	1.85		5.12	1.89	
	Intervention	Male	5.67	1.53	.812	3.52	1.30	.390
		Female	5.23	1.95		3.85	1.93	
About the CDM process	Comparison	Male	4.79	2.29	**.024**	5.06	2.40	.726
		Female	5.69	1.98		4.92	2.08	
	Intervention	Male	5.90	1.81	.599	3.42	1.47	.981
		Female	5.17	2.21		3.41	2.07	
About the self	Comparison	Male	4.66	2.30	**.017**	4.71	2.26	.423
		Female	5.67	2.19		5.04	2.10	
	Intervention	Male	5.65	1.85	.637	3.26	1.47	.241
		Female	5.36	2.28		3.75	2.10	
About occupations	Comparison	Male	5.09	2.27	.086	5.26	2.27	.729
		Female	5.78	2.09		5.39	2.00	
	Intervention	Male	5.53	2.02	.611	4.03	1.73	.570
		Female	5.47	2.29		4.29	2.24	
About obtaining additional information	Comparison	Male	4.73	2.29	**.037**	4.87	2.23	.430
		Female	5.61	2.18		5.19	2.09	
	Intervention	Male	5.58	1.68	.775	3.44	1.48	.173
		Female	5.28	2.26		4.05	2.29	
Inconsistent information	Comparison	Male	4.13	1.58	.102	4.34	1.80	.297
		Female	4.61	1.55		4.69	1.75	
	Intervention	Male	4.69	1.50	.120	3.45	1.60	.584
		Female	4.76	1.51		3.66.	1.89	

(continued)

Table 10.2 (continued)

Instrument	Group	Gender	Time 1 *M*	Time 1 *SD*	Time 1 *p*	Time 4 *M*	Time 4 *SD*	Time 4 *p*
Unreliable information	Comparison	Male	4.29	1.93	.269	4.45	2.01	.331
		Female	4.69	1.91		4.81	1.92	
	Intervention	Male	4.35	1.77	**.023**	3.27	1.72	.565
		Female	4.98	1.88		3.51	2.07	
Internal conflicts	Comparison	Male	4.19	1.75	.065	4.43	1.82	.253
		Female	4.82	1.83		4.83	1.92	
	Intervention	Male	4.87	1.71	.450	3.62	1.81	.580
		Female	4.74	1.74		3.86	2.09	
External conflicts	Comparison	Male	3.73	2.32	.565	3.95	2.30	.647
		Female	4.00	2.24		4.14	2.13	
	Intervention	Male	4.76	2.41	.420	3.29	2.04	.826
		Female	4.51	2.63		3.39	2.20	
Total CDDQr	Comparison	Male	4.68	1.46	.075	4.81	1.63	.580
		Female	5.13	1.27		4.96	1.43	
	Intervention	Male	5.23	1.14	.461	3.82	1.14	.661
		Female	5.06	1.23		3.96	1.53	

Note. Significant *p*-values are highlighted in bold indicating significant difference in scores between male and female students.

In summary, no significant interactions were found between time and gender on decision-making difficulties as measured by the total CDDQr scale, the three main and 10 subcategories of difficulties for both intervention and comparison groups. Means scores between male and female students were significantly different at Time 1 for the intervention group for difficulties due to lack of motivation and unreliable information. Male students reported significantly greater difficulties due to lack of motivation while female students reported significantly greater difficulties due to unreliable information. For the comparison group, female students reported significantly greater difficulties due to lack of information about the CDM process, self and additional ways to obtain information at Time 1. However, at time 4, there were no significant differences between male and female students in both groups.

10.4.3.2 Results from intervention group only

The assumption of sphericity was violated, as assessed by Mauchly's test of sphericity, $p < .001$. Therefore, a Greenhouse-Geisser correction was applied ($\varepsilon = 0.77$) to correct the one-way repeated measures ANOVA (Maxwell & Delaney, 2004). Results from repeated measures ANOVA showed that the interaction between time and gender on career decision-making difficulties as measured by the total CDDQr scale was not significant, F (2.30, 228.14) = .53, $p = .618$, partial $\eta^2 = .01$. Follow-up univariate tests revealed that mean scores for male and female students were not significantly different at all four time points. Pairwise comparisons revealed that career indecision decreased significantly for both male and female students from Time 2 to Time 3. The mean difference for female students (1.12, 95% CI (0.84, 1.40), $p < .001$) was slightly greater than male students (1.04, 95% CI (0.55, 1.54), $p < .001$).

Gender was also examined as it relates to the main and subcategories of difficulties and the results are presented below.

(1) Lack of readiness

The assumption of sphericity was violated, as assessed by Mauchly's test of sphericity, $p < .001$. Therefore, a Greenhouse-Geisser correction was applied ($\varepsilon = 0.85$) to correct the one-way repeated measures ANOVA (Maxwell & Delaney, 2004). Results from repeated measures ANOVA showed that the interaction between time and gender on career decision-making difficulties due to lack of readiness was not significant, F (2.55, 252.21) = .142, $p = .911$, partial $\eta^2 = .00$. Follow-up univariate tests revealed that mean scores for male

and female students were not significantly different at all four time points. Pairwise comparisons revealed that difficulties due to lack of motivation decreased significantly for female students only. The mean difference for female students was 0.59, 95% CI (0.32, 0.87), $p < .001$. Although difficulties due to lack of motivation also decreased for male students, the mean difference was not significant ($p = .072$).

(2) Lack of information

The assumption of sphericity was violated, as assessed by Mauchly's test of sphericity, $p < .001$. Therefore, a Greenhouse-Geisser correction was applied ($\varepsilon = 0.76$) to correct the one-way repeated measures ANOVA (Maxwell & Delaney, 2004). Results from repeated measures ANOVA showed that the interaction between time and gender on career decision-making difficulties due to lack of information was not significant, F (2.28, 225.73) = 1.154, $p = .322$, partial $\eta^2 = .01$. Follow-up univariate tests revealed that mean scores for male and female students were not significantly different at all four time points. Pairwise comparisons revealed that difficulties due to lack of information decreased significantly for both male and female students. The mean difference for male students was 1.53, 95% CI (0.83, 2.23), $p < .001$ while the mean difference for female students was 1.63, 95% CI (1.22, 2.04).

(3) Inconsistent information

The assumption of sphericity was violated, as assessed by Mauchly's test of sphericity, $p < .001$. Therefore, a Greenhouse-Geisser correction was applied ($\varepsilon = 0.76$) to correct the one-way repeated measures ANOVA (Maxwell &

Delaney, 2004). Results from repeated measures ANOVA showed that the interaction between time and gender on career decision-making difficulties due to inconsistent information was not significant, F (2.38, 235.17) = 0.10, p = .932, partial η^2 = .00. Follow-up univariate tests revealed that mean scores for male and female students were not significantly different at all four time points. Pairwise comparisons revealed that difficulties due to inconsistent information decreased significantly for both male and female students. The mean difference for male students was 1.07, 95% CI (0.54, 1.61), $p < .001$ while the mean difference for female students was 1.03, 95% CI (0.70, 1.36).

(4) Ten subcategories of difficulties

The interactions between time and gender on the 10 difficulty subcategories were not significant. Follow-up univariate tests revealed that mean scores for male and female students were not significantly different at all four time points except for difficulties related to lack of motivation at Time 1 (p = .001) and Time 3 (p = .007). Male students reported significantly greater difficulties related to lack of motivation at Time 1 compared to female students. However at Time 2, the difference was not significant. At Time 3, male students reported significantly greater difficulties compared to female students, but the difference was not significant at Time 4. Difficulties related to lack of motivation increased for male students after the intervention but the increase was not significant. For female students, difficulties related to lack of motivation decreased after the intervention but the decrease was not significant either.

For other subcategories of difficulties, both male and female students experienced significant decreases after the intervention at Time 3 except for difficulties related to dysfunctional beliefs, where the decrease for male students was not significant. Overall, female students recorded greater mean difference for difficulties related to lack of information about the CDM process, lack of information about self, and lack of information about occupations, while male students recorded greater mean difference in scores for difficulties related to lack of information about additional ways of obtaining information and inconsistent information due to external conflicts.

In summary, there were no interaction effects between time and gender on decision-making difficulties as measured by the CDDQr, the three main categories and the 10 subcategories of difficulties. Follow-up tests revealed that the decrease in difficulties due to lack of readiness after the intervention was not significant for male students. Further examination of the subcategories within the lack of readiness category showed that male and female students differed significantly in difficulties related to the lack of motivation at Time 1 and Time 3. It was also found that the intervention did not result in significant changes in difficulties related to lack of motivation for both male and female students. In the subcategory of difficulties related to dysfunctional beliefs, it was found that the intervention did not result in significant changes in male students.

10.5 Discussion of findings

This chapter addresses the fifth and final research question regarding the role of gender in career interventions. Results from the statistical analyses indicated that no significant interactions were found between time and gender on the three constructs as measured by the total CDSES-SF scale or its four subscales, the CDS and the CDDQr and its three main and 10 subcategories of difficulties for both intervention and comparison groups, and for the intervention group only.

Analyses of the intervention group with regards to CDMSE showed no significant gender differences except for the problem-solving subscale for Time 1 where male students reported significantly higher self-efficacy related to problem-solving prior to the intervention. However, at Times 2, 3, and 4, there was no significant difference between female and male students. Male and female students were not significantly different at all other time points and for other subscales. While male students recorded slightly higher intervention effects for goal selection and decision-making, and female students recorded slightly higher intervention effects for problem-solving, the difference between male and female students was not significant after the intervention. Contrary to findings by Scott and Ciani (2008) who found significant intervention gains for female students in self-efficacy for career planning and problem-solving, the present investigation did not find differences in the way male and female students responded to the intervention. However, the findings are consistent

with studies such as Grier-Reed and Skaar (2010) who did not find significant gender differences after the intervention to increase CDMSE.

In analyses of the intervention group concerning career indecision, it was found that male students have significantly higher career indecision compared to female students prior to the intervention at Time 2. However, at Time 3 after the intervention, the difference between male and female students was not significant. These findings suggest that the intervention had a greater impact on male students in that it was able to bring them to a level of career indecision that was equivalent to female students post-intervention. This shows that the intervention affected male and female students differently. Contrary to the findings by Neice and Bradley (1979, Lunneborg (1975), Osipow (1990) and Taylor and Popma (1990) who proposed that there is no link between career indecision and gender, the findings of the present study show that male students experienced greater intervention gains compared to female students. The difference in findings could be due to the difference in research design and emphasis. The earlier studies are cross-sectional in design and did not include an intervention. The present study, on the other hand, is longitudinal in design which enabled changes to be observed, and included an intervention.

In comparing intervention and comparison groups at Time 1, it was found that male and female students in the intervention group differed significantly for difficulties due to lack of motivation and unreliable information. Male students reported significantly greater difficulties due to lack of motivation while female students reported significantly greater difficulties due to unreliable

information. For the comparison group, female students reported significantly greater difficulties due to lack of information about the CDM process, self and additional ways to obtain information at Time 1. However, at time 4, there were no significant differences between male and female students in both groups.

In analyses for the intervention group only, male and female students differed significantly in difficulties related to the lack of motivation at Time 1 and Time 3 with male students reporting significantly greater difficulties with the lack of motivation. It was also found that the intervention did not result in significant changes in difficulties related to lack of motivation for both male and female students. In the subcategory of difficulties related to dysfunctional beliefs, it was found that the intervention did not result in significant changes in male students. Except for the subcategory of lack of motivation and dysfunctional beliefs, no significant gender differences were found in other main and subcategories of difficulties. These findings contradict the findings of Gati et al. (1996) who did not find significant gender differences in their sample of American and Israeli students. However, these findings are consistent with studies by Mau (2000), and Zhou and Santos (2007) who found significant gender differences in their sample of Taiwanese and British students respectively with regards to decision-making difficulties. However, it must be noted that gender differences for the intervention group were confined to only one main category of difficulty namely the lack of readiness category. No significant gender differences were found in the other two main categories of difficulties.

In conclusion, gender differences were found in two of three constructs investigated. Male students reported significantly greater career indecision prior to the intervention, but the difference between male and female students disappeared after the intervention suggesting that male students also experienced greater intervention gains. Male students also reported significantly greater difficulties with the lack of motivation prior to and after the intervention, and the intervention did not result in significant changes in dysfunctional beliefs for male students. Therefore, the hypothesis was only partially supported.

A main contribution of the present study to intervention research concerning gender is that interventions affect male and female students differently in the area of career indecision and decision-making difficulties. Therefore, it is crucial to take into consideration the specific concerns of male and female students in order to provide the help they need.

10.6 Chapter summary and conclusions

This chapter presented the statistical analyses of data in order to answer the fifth research question regarding the role of gender in interventions.

It has been found that of the three constructs investigated, gender differences can be observed for two constructs only. Male students reported significantly greater career indecision prior to the intervention but the difference disappeared after the intervention. Male students perceived greater difficulties

with the lack of motivation and the intervention did not result in significant changes in dysfunctional beliefs in male students. It appears that male students have significantly greater difficulties due to the lack of readiness in making career decisions compared to female students. This finding has important implications for the design and development of suitable interventions for students. For example, as it was found that male students struggle with the lack of readiness to make career decisions, career interventions should incorporate components that specifically address this difficulty among male students in order for male students to benefit from the intervention. This will be discussed in greater depth in the next chapter.

The next chapter presents the overall discussion of the findings of this study, the theoretical and practical implications as well as suggestions for further research.

CHAPTER 11 – GENERAL DISCUSSION, IMPLICATIONS, AND FUTURE RESEARCH

11.1 Chapter overview

This chapter begins by summarising the research findings based on the research aims and questions outlined in Chapter three. This is then followed by a discussion of the theoretical, practical and methodological implications of these findings. It then proceeds with a discussion of the limitations of the study and suggestions for future research. A set of recommendations for implementing career interventions in schools and colleges in Malaysia is proposed. The chapter then concludes with a summary of the overall contributions of the present study to intervention research.

11.2 Summary of research findings

The main aims of the present study were to develop a theoretically-based career intervention to help college students make career decisions and to evaluate its effects on career decision-making self-efficacy (CDMSE), career indecision and career decision-making difficulties. A review of research literature concerning career decision-making identified several gaps in knowledge. First, while many intervention studies have investigated their effects on modifying CDMSE, few studies have investigated career indecision and career decision-making difficulties as intervention effects. Therefore, the relationships among the three constructs, namely CDMSE, career indecision, and decision-making difficulties have not been explored. Second, despite the

increasing numbers of students entering post-secondary education, and the increasing demand for career interventions for college students, there are few intervention studies that have clearly articulated theoretical bases. Third, findings regarding gender and its impact on career interventions have been inconclusive suggesting more research is necessary. Finally, most studies on career decision-making (including those on career interventions) were conducted with Western populations, with very few with Asian populations, and none (to my knowledge) with Malaysian students. Additionally, the three instruments that are widely used to measure career indecision, career decision-making difficulties, and CDMSE, namely the CDS, CDDQ and CDSES/CDSES-SF, have not been used with a Malaysian sample.

Previous research has demonstrated that CDMSE is a malleable construct and interventions incorporating Bandura's sources of information on which self-efficacy is modified are successful in increasing CDMSE among participants. Therefore, a career intervention in the form of a career course that is based on Crites' (1971) Career Maturity Theory, which provides opportunities to participants to be exposed to Bandura's (1986) four sources of information through which self-efficacy is modified, and incorporates Brown and Ryan Krane's (2000) five critical ingredients was developed, and its effects on CDMSE, career indecision and career decision-making difficulties were examined. The relationships among the three constructs and the impact of gender were also investigated. As it was important to determine if the three main instruments for data collection could reliably measure the three constructs in a Malaysian sample, the factor structure of these instruments was examined.

Given the research aims and the gaps in literature, five research questions and nine hypotheses were developed and investigated. The findings of the present study provided answers to the research questions of the thesis and are discussed in turn here.

First, investigations into the factor structure of the three main instruments reveal that the CDSES-SF (Betz et al., 1996) did not provide a good fit to the data on Malaysian college students. The factor structure of the CDSES-SF using a Malaysian sample did not correspond with the five subscales posited by Betz et al. (1996). In fact, a four-factor structure provided a better fit to the data suggesting that the CDSES-SF should be used as a general measure of career decision-making self-efficacy for non-American populations such as Malaysia. Investigation into the factor structure of the CDS (Osipow et al, 1976) shows that data from Malaysian students supported a four factor solution consistent with findings from previous studies. The results also show that the taxonomy of decision-making difficulties as measured by the CDDQr (Gati & Saka, 2001b) provided a good fit to the data and is therefore a reliable measure of career decision-making difficulties for Malaysian college students.

Second, the present study found support for the effectiveness of interventions to increase CDMSE that are based on Crites' (1978) Career Maturity Theory, provided opportunities to participants to be exposed to the four sources of information proposed by Bandura's (1986) through which self-efficacy is modified, and incorporates Brown and Ryan Krane's (2000) five critical ingredients. The results reveal that CDMSE increased significantly for the

intervention group compared to the comparison group. For the intervention group alone, CDMSE increased significantly after the intervention at Time 3, compared to the no-intervention period from Time 1 to Time 2. The intervention had the largest impact on goal selection with this subscale recording the largest increase. The effects of the intervention were also maintained at follow-up four weeks later. Taken together, these results demonstrate that the intervention was effective in increasing CDMSE.

Third, the results reveal that interventions aimed at increasing CDMSE are also effective in reducing career indecision. Compared to the comparison group, the results show that the intervention group exhibited significant decreases in career indecision post-intervention. Similarly, participants in the intervention group reported significant decreases in career indecision after the intervention at Time 3, compared to the period when there was no intervention. Moreover, the effects of the intervention were maintained at follow-up four weeks later. These results provide evidence of the effectiveness of interventions aimed at increasing CDMSE in reducing career indecision.

Fourth, the results of the present study also show that career interventions aimed at increasing CDMSE are also effective in reducing career decision-making difficulties. The intervention group showed significant decreases in overall career decision-making difficulties and in the three main categories of difficulties, compared to the comparison group. In analyses with the intervention group only, the results showed that there were significant decreases in decision-making difficulties at Time 3 after the intervention

compared to the period when there was no intervention. The effects of the intervention were also maintained at follow-up four weeks later. Taken together, these results demonstrate that the intervention was effective in reducing decision-making difficulties. However, an examination of the 10 subcategories of difficulties revealed that the decrease in difficulties related to the lack of motivation was not significant and the decrease in difficulties related to dysfunctional beliefs was minimal. The results also show that the intervention had the largest impact on difficulties related to the lack of information about the career decision-making process and difficulties related to the lack of information on self.

Fifth, the results reveal that the level of CDMSE post-intervention had significant direct effects on the level of career indecision, accounting for 22.00% of the variance of career indecision at follow-up. This suggests that an increase in overall CDMSE post-intervention (at Time 3) is able to predict a decrease in career indecision at follow-up four weeks later.

Sixth, the results reveal that the level of CDMSE post-intervention had significant direct effects on the level of career decision-making difficulties, accounting for 30.50% of the variance of career decision-making difficulties at follow-up. This suggests that an increase in overall CDMSE post-intervention (at Time 3) is able to predict a decrease in career decision-making difficulties at follow-up four weeks later. Compared to career indecision, the level of CDMSE post-intervention appears to have had greater effects on decision-making difficulties. These findings were similar to the findings using SEM. A

structural model that includes all three constructs was developed. The findings of this structural model using SEM suggest that CDMSE at Time 3 had significant causal effects on career indecision and decision-making difficulties at Time 4, explaining 26.3% of the variance of career indecision and 25% of the variance of decision-making difficulties.

Seventh, the results show that of the three constructs investigated, gender differences were observed for career indecision and career decision-making difficulties. Significant differences were observed between male and female students prior to the intervention but these differences disappeared after the intervention suggesting that the intervention had a greater impact on male students in reducing career indecision compared to female students. The results also show that male students have significantly greater difficulties due to the lack of readiness in making career decisions compared to female students. Specifically, male students perceived greater difficulties with the lack of motivation and the intervention did not result in significant changes in dysfunctional beliefs in male students. Gender had no impact on CDMSE.

In summary, the findings of the present study show that all research aims have been addressed and answers to research questions have been provided. The next section presents a discussion of these results in relation to their theoretical, practical and methodological implications.

11.3 Theoretical and practical implications

11.3.1 Instruments to measure CDMSE, career indecision and decision-making difficulties

Studies focused on assessing CDMSE, career indecision and decision-making difficulties form a huge part of the research literature on career decision-making. This is not surprising because psychometric testing is important for career psychologists and counselling practitioners to establish a more complete profile of their clients in order to develop suitable interventions. In addition, these instruments are useful in evaluating the effectiveness of interventions designed to improve the career decision-making process. Furthermore, as suggested by Fouad (1993), only culturally appropriate tools should be used in vocational assessment.

The present study shows that although the CDMSE construct is theoretically-based and is widely used by researchers in intervention studies, the factor structure of the CDSES-SF (by Betz et al., 1996) that is used predominantly to measure this construct did not correspond with the theorised five career competencies by Crites (1978) on which the subscales are based. In fact, the findings of the present study show that a four factor structure better described the data for Malaysian college students. The present study therefore raises the question as to whether the subscales of the CDSES-SF should continue to be used by researchers on populations outside of the USA when conceptual equivalence may be an issue for international samples (Miller et al., 2009).

However, given the usefulness of the CDMSE construct in intervention research, and the high coefficient alpha for the total scale which indicates internal reliability, the CDSES-SF should continue to be used as a general measure of CDMSE. Given the usefulness of subscales in the CDSES-SF, further psychometric evaluation of the subscales with Malaysian students should be undertaken before the proposed four-factor solution is adopted for use with other Malaysian samples.

In addition to using Confirmatory Factor Analysis (CFA) in the psychometric evaluation of the CDSES-SF, researchers such as Nam et al. (2011), and Makransky et al. (2014), proposed using a Rasch Model approach to investigate the generalisability of the CDSES-SF across different cultures and language versions, as this approach provides a direct test of the validity of the instrument by using a total score for the main scale and the five subscales. According to these researchers, this method may provide evidence of dimensionality of the CDSES-SF across different settings. Therefore, future psychometric studies of the CDSES-SF should explore using this approach.

The present study supports a four factor structure of the CDS (by Osipow et al., 1976) that closely resembles the model which was proposed by Shimizu et al. (1988) where an additional one item was removed, suggesting that the 12 items of the Indecision Scale of the CDS by Osipow et al. (1976) can be divided into four subscales that correspond with the four factors. These findings support research efforts that the CDS can be used to measure four specific difficulties related to career indecision in addition to being an overall measure of career

indecision. However, the CDS is mostly used as a general measure of career indecision possibly due to the fact that there is now a latter instrument that is more widely used to assess specific difficulties (i.e., the CDDQ/CDDQr) which is discussed below.

The CDDQr (by Gati & Saka, 2001) has been found to be a reliable measure of career decision-making difficulties for Malaysian college students. Although the lack of readiness category, specifically the dysfunctional beliefs subcategory, is less reliable compared to the other two main categories difficulties, this taxonomy of difficulties in career decision making is both useful and practical in career intervention research. Specifically, there is great utility for the main and subcategories of difficulties in understanding the unique difficulties faced by students in careers counselling and in evaluating the effects of interventions designed to help students overcome decision-making difficulties. Based on the findings of the present study, this instrument is robust in measuring decision-making difficulties for Malaysian students and is able to distinguish between various types of difficulties. It is therefore highly recommended for use with students in Malaysia in assessing career decision-making difficulties and in evaluating the effects of interventions designed to reduce decision-making difficulties.

Overall, the present investigation has initiated a psychometric evaluation of the three instruments that are widely used in career intervention research for use with a Malaysian population. It is crucial to establish the applicability and validity of instruments that were developed in other countries for use with a

Malaysian population because this has implications for interventions developed for the same population. For example, while the CDMSE is a useful construct within career decision-making, an instrument that is able to accurately measure this construct is needed in order to evaluate the effectiveness of interventions that are developed to improve CDMSE for this population. In this instance, the CDSES-SF may need to be revised and adapted for use with a Malaysian population. The findings of the present study represent an important contribution to cross-cultural career development research generally, and psychometric testing specifically.

11.3.2 Effectiveness of the intervention

The present study provides empirical support that CDMSE is a malleable construct and that career interventions that are based on Crites' (1978) Career Maturity Theory, and provide opportunities for participants to be to exposed to Bandura's (1977) four sources of information through which self-efficacy is modified, are effective in increasing CDMSE. These findings have important theoretical and practical implications for future interventions targeted at increasing students' CDMSE. Principally, as the CDMSE construct is based on both Crites' (1978) Career Maturity Theory and Bandura's (1977) self-efficacy theory, it follows that an intervention that is based on these two theories would be effective in modifying it. This intervention was carefully designed and included the necessary activities to ensure that participants were able to develop the five career competencies proposed in Crites' (1978) Career Maturity Theory. Furthermore, it included sufficient opportunities for

participants to be exposed to and participate in the four sources of information proposed by Bandura on which self-efficacy is modified. The present study also integrated Brown and Ryan Krane's (2000) critical components in career interventions and although it is not clear which of these five components were responsible for the effectiveness of the intervention, the positive outcomes of the intervention are consistent with findings of previous studies. Additionally, the intervention took into consideration the cultural context of college students in Malaysia and their unique challenges, for example, the influence of parents in career decision-making, and incorporated strategies and activities to help them understand and navigate familial influences and expectations. Addressing career decision-making issues specific to this group of students is important so that the course is relevant to this population and is able to meet their needs. This is in keeping with the suggestion by Fouad and Bingham (1995) who proposed that successful career interventions should attend to the cultural context of the participants. In summary, the intervention has provided a model on which future interventions for Southeast Asian college students can be based. It can also be adapted to suit different populations and age groups to save time and resources.

The present study reveals that based on the attrition analyses in Chapter eight, participants in the intervention group who completed the course had significantly higher CDMSE scores compared to those who attended the first session but dropped out of the course after that. This finding suggests that those who remained on the course and eventually completed it were more motivated or were more optimistic about their abilities in completing tasks related to

making career decisions. It is unclear if students dropped out of the course because of their significantly lower perceived CDMSE (i.e., lesser confidence in carrying out tasks specific to making career decisions) or if they had other commitments (academic or extracurricular) that prevented them from attending subsequent sessions of the course. However, it is important for students to attend all four sessions of the course to benefit fully from it because each session of the course focuses on different career decision-making competencies. Therefore, in designing interventions for students, it is important to ensure that students attend all four sessions. In order to encourage better attendance, it may be worthwhile to work with college administrators to make the course compulsory for new students so that the course is part of their curriculum; or make the course an elective credit-bearing subject so that students will be motivated to attend the sessions in order to earn the credit.

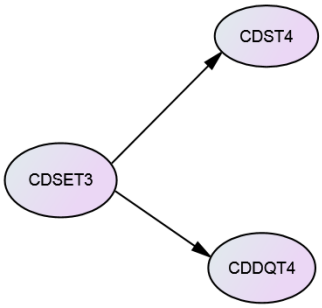
The present study provides empirical support that interventions aimed at increasing CDMSE are also effective in reducing career indecision and decision-making difficulties. It would appear that strategies and activities aimed at increasing CDMSE, specifically in improving participants' competencies in making career decisions, and providing sufficient opportunities for participants to be exposed to and participate in Bandura's four sources of information on which self-efficacy is modified, have a direct impact on reducing career indecision and decision-making difficulties. The findings reveal that for the intervention group, the decrease in difficulties related to the lack of motivation was not significant, while the decrease in difficulties related to dysfunctional beliefs was marginal. Compared to the other main categories

of difficulties, the intervention appears to have had the smallest impact on difficulties related to readiness. A review of the intervention shows that the four sessions including the strategies and activities adopted did not specifically address the issue of readiness in making career decisions. Therefore, new approaches or strategies need to be explored and included in the intervention to address difficulties related to readiness. For example, for difficulties related to the lack of motivation to make career decision, it may be helpful to encourage students to set deadlines for specific career decision-making tasks that would ultimately lead them to making a career decision. For difficulties related to dysfunctional beliefs, it may be helpful to explore the use of a 'cognitive-behavioural therapy approach' proposed by Kleiman et al. (2004, p. 328) as dysfunctional beliefs fall within the cognitive dimension of career indecision (Kleiman et al., 2004).

The study also supports the effectiveness of career courses as interventions to reduce career indecision and decision-making difficulties among college students. The intervention in the present study is only two hours a week and can be completed within four weeks. Considering that career courses are able to reach larger numbers of students in a shorter period of time, and are more cost effective compared to individual or group counselling, career courses may be a viable form of career intervention for undecided college students in Malaysia, as theoretically-based and empirically-validated interventions are not yet available in this country.

11.3.3 Relationships among constructs

The present study reveals that CDMSE, career indecision and decision-making difficulties are significantly related. CDMSE is moderately and negatively correlated with career indecision and decision-making difficulties. In addition to a correlational relationship, the findings also reveal that the increased level of CDMSE at post-intervention was able to predict decreased levels of career indecision and decision-making difficulties at follow-up four weeks post-intervention. These results were replicated in the structural model using SEM where CDMSE is shown to exert significant causal effects on career indecision and decision-making difficulties. Taken together, these results suggest a causal relationship between CDMSE and career indecision, and between CDMSE and decision-making difficulties, meaning that an increase in CDMSE will cause a decrease in both career indecision and decision-making difficulties. See Figure 11.1 below for a simplified structural model of the relationship among the three constructs.



CDSET3 = CDMSE at Time 3; CDST4 = Career indecision at Time 4; CDDQT4 = Decision-making difficulties at Time 4

Figure 11.1. Simplified structural model of the relationship among CDMSE, career indecision and decision-making difficulties.

Theoretically, these findings provide empirical support to social cognitive models, such as the SCCT (by Lent et al., 1994), in describing the career decision-making process where self-efficacy is presumed to be a direct causal antecedent to behavioural outcomes (i.e., career indecision and decision-making difficulties).

Practically, these findings show that interventions focused on modifying CDMSE will have an impact on career indecision and decision-making difficulties. This understanding of the relationship among these constructs adds to our confidence in using interventions that are aimed at increasing CDMSE to help undecided students and students who experience difficulties in making career decisions.

Overall, the findings of the present study contribute significantly to intervention research because these three constructs have not been examined in a single study before. Furthermore, the present study has initiated an investigation into the relationship among these constructs using SEM in a Malaysian context which to my knowledge has not been done previously.

11.3.4 Gender and career decision-making

The present study shows that male students had significantly higher levels of career indecision compared to female students prior to the intervention but the intervention was able to minimise the difference between male and female students, suggesting that the intervention affected male and female students

differently. The implication of this finding is that course developers need to include opportunities in interventions to deal with specific issues concerning male and female students.

The present study also reveals that male students perceived significantly greater difficulties concerning the lack of readiness to make career decisions compared to female students. Specifically, the results reveal that the intervention did not result in significant changes in the lack of motivation and dysfunctional beliefs in male students. Therefore, career interventions should incorporate components that specifically address difficulties concerning the lack of readiness among male students in order for them to benefit from the intervention. It may also be important for the course developer to understand the reasons behind this lack of motivation to make career decisions among male students and if there are specific erroneous beliefs that are preventing them from making career decisions.

In Malaysia where the participation of women in the economy in general, and in engineering and scientific roles specifically, remain low, there is a need for career interventions to inspire female students to consider non-traditional careers (i.e., careers beyond education, human health and social work as discussed in section 1.4). On the other hand, career interventions should also encourage male students to explore career opportunities in fields beyond science and engineering. Therefore, with adequate preparation and planning, career interventions have the potential to eliminate gender differences and bias towards certain careers for both male and female students.

11.3.5 Future research work

Given the encouraging findings of the present study, and the ease with which the intervention can be immediately adopted in colleges, I hope to persuade one pre-university college in Kuala Lumpur to make the intervention a compulsory component for all new students in 2016. As the college has three intakes for new students every year, there would be sufficient opportunity to carry out the course, gather feedback and refine the course further for subsequent batches of students within one year. Once the course is able to yield fairly consistent results (in terms of increased CDMSE, and decreased indecision and difficulties), I aim to persuade other colleges to adopt the intervention as a compulsory component or as part of their extracurricular offerings for students. At the same time, I hope to be able to adapt the course for students in secondary schools, and carry out a pilot course in one school in Kuala Lumpur by 2017.

11.4 Methodological implications

A primary strength of the present study is its longitudinal research design as it enabled the changes in the three constructs to be observed. In addition, the inclusion of a comparison group provided data to be compared with the intervention group to establish that changes to the three constructs were the result of the intervention itself. Furthermore, the research design incorporated repeated measures in which the intervention group underwent both conditions, and each participant acted as his or her control. This design provided a check to

the data obtained from comparing the intervention and comparison groups. The longitudinal research design also enabled the relationships among the three constructs to be examined. By including a follow-up measurement time point, the hypothesised causal relationship between CDMSE and career indecision, and between CDMSE and decision-making difficulties could be examined. This is an extension of the pre-post model of intervention research design that are commonly adopted by previous researchers.

The present study illustrates an example of applied research. Two important lessons learnt as a researcher attempting to offer solutions to practitioners who are presented with undecided college students are that theory provides a framework on which an intervention can be developed, evaluated and thus improved. For example, Crites' (1978) Career Maturity Theory on which the five competencies of making good career decision were based, the four sources of information on which self-efficacy is modified proposed by Bandura (1986), and the critical ingredients of effective interventions by Brown and Ryan Krane (2000) provided the framework for the intervention. However, theory needs to be balanced by cultural sensitivity for the intervention to be relevant to the population for which it was designed. For example, the intervention included strategies to assist students in navigating familial expectations because parents of collectivistic societies such as Malaysia often exert a strong influence on their children's career decision-making. It is believed that the effectiveness and relevance of the intervention are the result of having such a framework in place and paying special attention to the cultural concerns of this population.

11.5 Limitations of study

Although the results of this study are encouraging, there are several limitations that should be noted. Firstly, participants were not randomly assigned to intervention and comparison groups, thereby increasing the possibility that the groups were not equivalent and there was a self-selection bias. However, it is felt that the bias is minimal because students in the comparison group had the same opportunity to attend the course but were unable to do so because of clashes in their timetable. Furthermore, at pre-intervention, the difference between both groups was not significant for all three constructs measured, but the difference between groups was significant post-intervention. Moreover, the intervention group underwent both conditions – with and without intervention – and the findings show there were significant changes after the intervention. Therefore, the changes in the three constructs being investigated may be attributed solely to the intervention.

Secondly, the objectives of the course were extensive, and as such, may not have been addressed adequately in the course. Given the eight-hour time limit for the course, it was felt that certain activities had to be rushed through in order to complete every one of them. More time should be allocated for discussion of career decision-making issues that were pertinent to students, and for reflection on the lessons learned so that these can be applied in their own situations. The course could be further improved by including activities that would make a difference in reducing difficulties related to the lack of motivation to make career decisions and dysfunctional beliefs that hinder

students from progressing in their career decision-making journey.

Thirdly, the sample consisted primarily of students from two pre-university colleges, and as such the findings of this study cannot be generalised to include all college students in Malaysia. Furthermore, these students were at the beginning of their pre-university studies and may therefore be less ready to make career decisions. By using a different sample of college students at different stages of their pre-university studies, future researchers may better examine the effectiveness of the career intervention. In addition, the sample is not ethnically diverse, and is therefore not representative of the ethnic composition of students in Malaysia. However, it must be noted that students from 12 of 15 states of Malaysia were represented in the sample, and the ethnic composition of the sample is representative of students in private colleges in Malaysia.

11.6 Suggestions for future research

As the number of students entering post-secondary education will increase, the need for career interventions will also increase. Therefore, in addition to face-to-face career interventions, future studies can explore the use of technology in delivering interventions to students. Technology is rapidly changing the way we access information, and students today are more connected to the Internet through their mobile devices and gadgets. Currently, there are websites where students can access and complete psychometric assessment instruments and receive immediate results online (e.g., www4.parinc.com). There are also

websites with information on careers and courses, provide opportunities for students to discuss their unique decision-making issues in web forums, and enable students to complete instruments that measure decision-making difficulties online (e.g., www.cddq.org and www.kivunim.com). Amir et al. (2008) have shown that while it is possible to provide accurate interpretative feedback on individuals' responses to the CDDQ online, they propose to include reservations when appropriate, as well as recommendations of ways to deal with the difficulties, which include seeing a counsellor. Therefore a web-based intervention may be a viable form of career intervention for students in addition to face-to-face interventions. The development costs for setting up a website to deliver interventions may be expensive, but once it is developed, these resources may be more cost effective, more easily accessible, and able to reach larger numbers of students, compared to face-to-face career interventions. Future studies can explore the effectiveness of self-accessed or self-directed courses that students can download or access and complete online, in helping undecided students make career decisions.

The present study investigated a career intervention for college students at the cusp of making important course and career decisions. Future studies can examine if interventions that have shown positive outcomes for college age students will have similar effects on younger students (such as those in primary and secondary school) and adults considering a career change. While the theoretical bases remain the same, the content of the course including the strategies and activities used need to be adapted to suit different age groups.

In view of multiple transitions within an individual's career, future research should also explore integrating adaptive career decision-making skills proposed by Krieshok et al. (2009) into career interventions. Their trilateral model of career decision-making proposes that reason, intuition and occupational engagement contribute to adaptive career decision-making. The model suggests that it is important to teach individuals to think and feel about experiential information in a more intentional way in preparation for the likelihood of career transitions. In an evolving world of work, it makes sense to teach our students to embrace uncertainty and flexibility. Therefore, instead of a one-time intervention, individuals should be prepared for a lifelong engagement with both internal and external worlds (Krieshok et al., 2009). In a similar vein, Savickas et al. (2009) propose that career interventions in the 21st century should adopt a life-design framework (that implements theories of self-constructing and career construction) that is life-long, holistic, contextual and preventive, and aims to increase clients' 'adaptability, narratability, activity and intentionality.' They propose that new approaches are necessary in the face of the rapidly changing work environment.

The present study relies heavily on repeated measures ANOVA to statistically test for change over time, specifically in examining the effects of the intervention on the three constructs. Structural equation modelling (SEM) advances the longitudinal analysis of data to include latent variable growth over time while modelling both individual and group changes using slopes and intercepts (Schumacker & Lomax, 2010). For example, the latent growth curve model (LGM) permits the analysis of individual parameter differences;

describes an individual's growth over time and detects the differences in individual parameters over time; and is able to test potential covariates of change (e.g., gender) and different change trajectories in the same analysis (Martens & Haase, 2006). It appears that LGM using SEM is able to provide researchers with a more powerful statistical method of analysing change over time. LGM was not used in the present study because it requires data from three measurement points over the course of the intervention (i.e., pre-, mid- and post-intervention) while the present study has only two measurement points (pre- and post-intervention). Future studies can include three measurement points over the course of the intervention and explore the use of LGM to analyse the effects of interventions.

11.7 Recommendations for the implementation of career interventions in Malaysia

On the basis of the findings of the present study, the following recommendations for the implementation of career interventions for school and college students in Malaysia are proposed.

Firstly, it is recommended that career interventions be offered to secondary school students as young as 15 years old (or students in Form three) in government-funded schools because students are expected to choose an academic stream at the beginning of Form four which requires them to select a list of subjects on which they will be examined at 17 (or at the end of Form five). In order to make good decisions, students need help in understanding

their interests, skills, values, and how they relate to majors and careers, and in identifying career opportunities in the future. As suggested by O'Brien et al. (2000), interventions provided at this stage for students at risk of academic or vocational underachievement have the potential to guard against premature foreclosure of occupational options. Similarly, career interventions should also be offered to students in pre-university colleges (like the students in this sample) because students at this stage of their education need to make decisions about courses to pursue at university. Decisions made at these two stages of a student's life will have an impact on his or her future.

Secondly, interventions for students should be theory-driven and take into consideration the unique challenges that students in Malaysia face. This is because theoretically-based empirically validated interventions (like the one described in this study) are able to equip students with key competencies in making career decisions, increase students confidence in making career decision, and reduce indecision and decision-making difficulties. The career course in the present study has been empirically tested and is therefore a model on which future interventions for school and college students can be based. In addition, the CDDQr (by Gati & Saka, 2001b) has been validated as a psychometrically sound instrument for Malaysian students and should be used to assess students' needs for career interventions.

Thirdly, particular attention needs to be paid to the training of career counsellors in schools and colleges. In keeping with the necessity to use theory-driven career interventions, career counsellors should be able to

translate theory and research into practical applications for students (Halasz & Kempton, 2000). In addition, career counsellors need to be trained to use psychometric instruments (such as the CDDQr) to assess students' needs and to evaluate the effectiveness of the career interventions. Furthermore, career counsellors need to be attuned to the specific concerns of students (whether they relate to culture, family or gender) in order to meet their needs.

It is clear that the above recommendations for schools and colleges cannot be implemented without a change to the current policy adopted for careers guidance and counselling in the country. As effective interventions are able to promote academic achievement and raise aspirations among students who are at risk of academic underachievement; encourage students in general to make optimal academic and career choices; smoothen the transition to college and increase students' level of job satisfaction post-university; it makes sense to dedicate more time and resources to this area.

11.8 Conclusions

Overall, the present study makes a number of important contributions to career intervention research.

Firstly, a promising result from the research project is the development of a theory-based intervention, which includes a student course book and a companion instructors' manual, that has been shown to be effective in increasing students' confidence in making career decision, and in reducing

career indecision and decision-making difficulties. This intervention also took into consideration the cultural context of students in Malaysia and included strategies to help students address issues that are pertinent in their own situations. As undecided students in Malaysia are in need of interventions to help them make career decisions, this intervention has provided a model on which future interventions for Malaysian students can be based. In addition, the findings of the present study supports the integration of four sources of information on which self-efficacy is based proposed by Bandura (1986) to modify CDMSE. Furthermore, the findings support the inclusion of Brown and Ryan Kran's (2000) five critical components of career interventions to improve outcomes, thus underlining the importance of theory-driven career intervention research.

Secondly, the present study has initiated an investigation of the relationships among CDMSE, career indecision, and decision-making difficulties, three important constructs within career decision-making generally and in career interventions specifically, that have not been previously explored in research literature. The findings of the causal relationship between CDMSE and career indecision, and between CDMSE and decision-making difficulties in the present study represents a significant advance in our understanding of how these constructs are related.

Thirdly, the factor structure of three main instruments that are widely used in career decision-making research was examined in order to determine if these are valid measures for college students in Malaysia. It has been found that the

subscales of the CDSES-SF (Betz et al., 1996) did not correspond with the theorised five factors of the theory on which the construct was based. Therefore, CDSES-SF should be used as a general measure of career decision-making self-efficacy for students in Malaysia. Investigation into the factor structure of the CDS shows that data from Malaysian students supported a four factor solution consistent with findings from previous studies. The present study also shows that the taxonomy of decision-making difficulties as measured by the CDDQr (Gati & Saka, 2001b) provided a good fit to the data and is therefore a reliable measure of career decision-making difficulties for Malaysian college students. Compared to the CDS, the CDDQr is a more robust instrument in that it is able to distinguish between difficulties and therefore provides a more accurate assessment of decision-making difficulties faced by students. The psychometric evaluation of these instruments contributes to cross-cultural career development research in general and to psychometric research specifically.

Fourthly, the present study also provided evidence that gender needs to be taken into consideration in the design and development of career interventions. Male students had significantly higher levels of career indecision before the intervention, but the difference between male and female students were not significant after the intervention, suggesting that the intervention had a greater impact on male students. Gender differences were also found in two areas of difficulties, with male students reporting significantly greater difficulties in the lack of motivation in making career decisions, and dysfunctional beliefs. An important contribution to research literature where gender is concerned is the

finding that although gender differences were reported prior to the intervention (e.g., for career indecision), no gender differences were reported after the intervention (except for two areas of difficulties mentioned above) suggesting that these differences were equalised as a result of the intervention. The implication for this finding is that interventions have the potential to address issues specific to male and female students, and to eliminate gender differences and bias.

Finally, a set of recommendations for the implementation of career interventions in schools and colleges in Malaysia has been proposed. These recommendations concern when interventions should take place, the type of interventions that should be carried out, and the personnel who would be ultimately responsible for the interventions. In order for these recommendations to be implemented, a change in government policy concerning career guidance and counselling is necessary.

Overall, the present study has met all the research aims set out in Chapter three, and the main contributions to research literature have been clearly presented. The world of work has changed rapidly over the last decade and will continue to evolve. Given the advances in technology today, it would appear that technology will play a central role in shaping careers of the future. Therefore, interventions that equip students with decision-making skills that can be applied in different phases of life, and prepare them to face work challenges as they occur in the future are much needed to ensure that the graduates of today remain relevant despite the unpredictability and changes concerning careers of

tomorrow. It is hoped that this thesis has served to provide important insights regarding effective career interventions that would benefit both researchers and practitioners in helping their students make successful career decisions.

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APPENDICES

The appendices below have been arranged in the order of their mention in the thesis:

Appendix A: *Making Career Decision (MCD) questionnaire booklet*

Appendix B: *Permission to use the CDSES-SF and CDDQr*

Appendix C: *Approval letter from the Research Ethics Committee*

Appendix D: *Student Consent Form*

Appendix E: *A. Student Course Book – sample pages*

B. Personal value cards – some samples

C. Handout on role models – an excerpt

Appendix F: *Manual for Instructors – sample pages*

Appendix G: *Sample responses from students in the feedback forms and email interviews*

Appendix A

Making Career Decisions (MCD) Questionnaire Booklet

Making Career Decisions

Instructions

- This questionnaire is divided into 3 sections and contains 77 items. It should not take you more than 30 minutes to complete the questionnaire
- Please make sure you provide a response for every item
- There are no right or wrong answers
- Please provide your response by *circling* the number that accurately reflects how you feel about the item
- Please provide the following details. They will be kept strictly confidential

Email _____

Mobile _____

Date of birth (dd/mm/yy) _____ **Age** _____

Race Malay / Chinese / Indian / Other **Sex** Male / Female

Not Malaysian, please specify nationality _____

College _____

Course _____

Course at university (leave blank if undecided) _____

Career (leave blank if undecided) _____

1

This section of the questionnaire contains some statements that people commonly make about their educational and career plans. Some of the statements may apply to you, others may not. Please read through each statement carefully and indicate how closely each item describes you in your thinking about a career or a choice of course/major by circling the appropriate number. An example is given below.

	Exactly like me	Very much like me	Only slightly like me	Not at all like me
I am excited about graduating and going to work.	(4)	3	2	1

If you are excited about going to work and feel no hesitation about it, you would circle '4' to indicate that the description is exactly the way you feel.

If the item is very close, but not exactly the way you feel – for example, you're generally excited about going to work after you graduate, but are experiencing some minor concerns about it – you would circle the number '3.'

You would circle '2' if the item describes you in some ways, but in general it is more unlike than like your feelings – for example, if you are generally more concerned than excited about work after graduation.

Finally, you would circle '1' if the statement does not describe your feelings at all; that is, you are experiencing a great deal of concern and no excitement about graduation and work.

Please give only **ONE** response to each item and answer **EVERY** item.

REMEMBER – 4 is *exactly like me*, **3** is *very much like me*, **2** is *only slightly like me*, and **1** is *not like me at all*

		CIRCLE ANSWER			
		Like me			Not like me
1)	I have decided on a career and feel comfortable with it. I also know how to go about implementing my choice.	4	3	2	1
2)	I have decided on a course/major and feel comfortable with it. I also know how to go about implementing my choice.	4	3	2	1
3)	If I had the skills or the opportunity, I know I would be a _____ but this choice is not really possible for me. I haven't given much consideration to any other alternatives, however.	4	3	2	1
4)	Several careers have equal appeal to me. I'm having a difficult time deciding among them.	4	3	2	1

REMEMBER – **4** is *exactly like me,* **3** is *very much like me,* **2** is *only slightly like me,* and **1** is *not like me at all*

		CIRCLE ANSWER			
		Like me			Not like me
5)	I know I will have to go to work eventually, but none of the careers I know about appeal to me.	4	3	2	1
6)	I'd like to be a _____, but I'd be going against the wishes of someone who is important to me if I did so. Because of this, it's difficult for me to make a career decision right now. I hope I can find a way to please them and myself.	4	3	2	1
7)	Until now, I haven't given much thought to choosing a career. I feel lost when I think about it because I haven't had many experiences in making decisions on my own and I don't have enough information to make a career decision right now.	4	3	2	1
8)	I feel discouraged because everything about choosing a career seems so 'iffy' and uncertain; I feel discouraged, so much so that I'd like to put off making a decision for the time being.	4	3	2	1
9)	I thought I knew what I wanted for a career, but recently I found out that it wouldn't be possible for me to pursue it. Now I've got to start looking for other possible careers.	4	3	2	1
10)	I want to be absolutely certain that my career choice is the 'right' one, but none of the careers I know about seems ideal for me.	4	3	2	1
11)	Having to make a career decision bothers me. I'd like to make a decision quickly and get it over with. I wish I could take a test that would tell me what kind of career I should pursue.	4	3	2	1
12)	I know what I'd like to major in or study, but I don't know what careers it can lead to that would satisfy me.	4	3	2	1
13)	I can't make a career choice right now because I don't know what my abilities are.	4	3	2	1
14)	I don't know what my interests are. A few things interest me but I'm not certain that they are related in any way to my career options.	4	3	2	1

Please turn over

REMEMBER – **4** is *exactly like me*, **3** is *very much like me*, **2** is *only slightly like me*, and **1** is *not like me at all*

		CIRCLE ANSWER			
		Like me			Not like me
15)	So many things interest me and I know I have the ability to do well regardless of what career I choose. It's hard for me to find just one thing that I would want as a career.	4	3	2	1
16)	I have decided on a career, but I'm not certain how to go about implementing my choice. What do I need to become a _____ anyway?	4	3	2	1
17)	I need more information about what different occupations are like before I can make a career decision.	4	3	2	1
18)	I think I know what to major in or study, but I feel I need some additional support for it as a choice for myself.	4	3	2	1

None of the above items describe me. The following would describe me and my situation better (please write your response here):

In this section of the questionnaire, please read each statement carefully and indicate how much confidence you have that you could accomplish each of these tasks by circling the appropriate number. An example is given below.

How much confidence do you have that you could:

	No confidence at all	Very little confidence	Moderate confidence	Much confidence	Complete confidence
Get letters of recommendation from your lecturers.	1	2	3	4	(5)

If you are very confident that you can do it, you would circle '5.'

If you are confident that you can do it but not completely confident, you would circle '4.'

If you have some confidence that you can do it, you would circle '3.'

If you have very little confidence that you can do it, you would circle '2.'

If you do not have any confidence at all that you can do it, you would circle '1.'

Please give only **ONE** response to each item and answer **EVERY** item.

REMEMBER – 1 is *no confidence at all,* **2** is *very little confidence,* **3** is *moderate confidence,* **4** is *much confidence,* and **5** is *complete confidence*

	HOW MUCH CONFIDENCE DO YOU HAVE THAT YOU COULD:	CIRCLE ANSWER No confidence				Complete confidence
1)	Use the internet to find information about jobs or occupations that interest you.	1	2	3	4	5
2)	Select one course/major from a list of potential courses/majors you are considering.	1	2	3	4	5
3)	Make a plan of your goals for the next five years.	1	2	3	4	5
4)	Determine the steps to take if you are having academic problems with an aspect of your chosen course/major.	1	2	3	4	5
5)	Accurately assess your abilities.	1	2	3	4	5
6)	Select one job or occupation from a list of potential occupations you are considering.	1	2	3	4	5

Please turn over

REMEMBER – 1 is *no confidence at all*, **2** is *very little confidence*, **3** is *moderate confidence*, **4** is *much confidence*, and **5** is *complete confidence*

	HOW MUCH CONFIDENCE DO YOU HAVE THAT YOU COULD:	CIRCLE ANSWER No confidence				Complete confidence
7)	Determine the steps you need to take to successfully complete your chosen course/major.	1	2	3	4	5
8)	Persistently work at your course/major or career goal even when you get frustrated.	1	2	3	4	5
9)	Determine what your ideal job would be.	1	2	3	4	5
10)	Find out the employment trends for an occupation over the next ten years.	1	2	3	4	5
11)	Choose a career that will fit your preferred lifestyle.	1	2	3	4	5
12)	Prepare a good CV or résumé.	1	2	3	4	5
13)	Change courses/majors if you did not like your first choice.	1	2	3	4	5
14)	Decide what you value most in a job or occupation.	1	2	3	4	5
15)	Find out about the monthly salary of people in a job or occupation.	1	2	3	4	5
16)	Make a career decision and then not worry whether it was right or wrong.	1	2	3	4	5
17)	Change jobs or occupations if you are not satisfied with the one you enter.	1	2	3	4	5
18)	Figure out what you are and are not ready to sacrifice to achieve your career goals.	1	2	3	4	5

REMEMBER – 1 is *no confidence at all*, **2** is *very little confidence*, **3** is *moderate confidence*, **4** is *much confidence*, and **5** is *complete confidence*

	HOW MUCH CONFIDENCE DO YOU HAVE THAT YOU COULD:	CIRCLE ANSWER No confidence				Complete confidence
19)	Talk with a person already working in a job or field you are interested in.	1	2	3	4	5
20)	Choose a course/major or career that will fit your interests.	1	2	3	4	5
21)	Identify employers, firms, and institutions relevant to your career options.	1	2	3	4	5
22)	Define the type of lifestyle you would like to live.	1	2	3	4	5
22)	Resist attempts by parents and friends to push you into a course you believe is beyond your abilities. (*Please skip this item*)	1	2	3	4	5
23)	Find information about postgraduate or professional training courses and colleges/universities.	1	2	3	4	5
24)	Successfully manage the job interview process.	1	2	3	4	5
25)	Identify some reasonable course/major or career alternatives if you are unable to get your first choice.	1	2	3	4	5

This questionnaire's aim is to locate possible difficulties and problems related to making career decisions.

Please begin by filling in the following information:

Number of years of education

(eg 6 years of primary school + 5 years of secondary school = 11) _____

Have you considered what field you would like to major in or what occupation you would like to choose?

Yes / No

If yes, to what extent are you confident of your choice?

Not confident at all **1 2 3 4 5 6 7 8 9** ***Very confident***

Next, you will be presented with a list of statements concerning the career decision-making process. Please rate the degree to which each statement applies to you on the following scale:

Does not describe me **1 2 3 4 5 6 (7) 8 9** ***Describes me well***

Circle '1' if the statement does not describe you and '9' if it describes you well. Of course, you may also circle any of the intermediate levels depending on how well or not it describes you.

For example, you will circle '6', '7' or '8' if the statement describes you to a larger extent.
You will circle '4', '3' or '2' if the statement does not really describe you.

Please do not skip any question.

For each statement, please circle the number which best describes you.

1)	I know that I have to choose a career, but I don't have the motivation to make the decision now ('I don't feel like it'). ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
2)	Work is not the most important thing in one's life and therefore the issue of choosing a career doesn't worry me much. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
3)	I believe that I do not have to choose a career now because time will lead me to the 'right' career choice. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
4)	It is usually difficult for me to make decisions. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
5)	I usually feel that I need confirmation and support for my decisions from a professional person or somebody else I trust. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
6)	I am usually afraid of failure. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
7)	I like to do things my own way. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
8)	I expect that entering the career I choose will also solve my personal problems. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
9)	I believe there is only one career that suits me. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***

Please turn over

For each statement, please circle the number which best describes you.

10)	I expect that through the career I choose I will fulfill all my aspirations. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
11)	I believe that a career choice is a one-time choice and a life-long commitment. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
12)	I always do what I am told to do, even if it goes against my own will. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
13)	I find it difficult to make a career decision because I do not know what steps I have to take. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
14)	I find it difficult to make a career decision because I do not know what factors to take into consideration. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
15)	I find it difficult to make a career decision because I don't know how to combine the information I have about myself with the information I have about the different careers. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
16)	I find it difficult to make a career decision because I still do not know which occupations interest me. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
17)	I find it difficult to make a career decision because I am not sure about my career preferences yet (for example, what kind of a relationship I want with people, which working environment I prefer). ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***

Please turn over

For each statement, please circle the number which best describes you.

18)	I find it difficult to make a career decision because I do not have enough information about my competencies (for example, numerical ability, verbal skills) and/or about my personality traits (for example, persistence, initiative, patience). ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
19)	I find it difficult to make a career decision because I do not know what my abilities and/or personality traits will be like in the future. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
20)	I find it difficult to make a career decision because I do not have enough information about the variety of occupations or training programs that exist. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
21)	I find it difficult to make a career decision because I do not have enough information about the characteristics of the occupations and/or training programs that interest me (for example, the market demand, typical income, possibilities of advancement, or a training program's prerequisites). ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
22)	I find it difficult to make a career decision because I don't know what careers will look like in the future. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
23)	I find it difficult to make a career decision because I do not know how to obtain additional information about myself (for example, about my abilities or my personality traits). ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
24)	I find it difficult to make a career decision because I do not know how to obtain accurate and updated information about the existing occupations and training programs, or about their characteristics. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***

Please turn over

For each statement, please circle the number which best describes you.

25)	I find it difficult to make a career decision because I constantly change my career preferences (for example, sometimes I want to be self-employed and sometimes I want to be an employee). ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
26)	I find it difficult to make a career decision because I have contradictory data about my abilities and/or personality traits (for example, I believe I am patient with other people but others say I am impatient). ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
27)	I find it difficult to make a career decision because I have contradictory data about the existence or the characteristics of a particular occupation or training program. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
28)	I find it difficult to make a career decision because I'm equally attracted by a number of careers and it is difficult for me to choose among them. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
29)	I find it difficult to make a career decision because I do not like any of the occupation or training programs to which I can be admitted. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
30)	I find it difficult to make a career decision because the occupation I am interested in involves a certain characteristic that bothers me (for example, I am interested in medicine, but I do not want to study for so many years). ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
31)	I find it difficult to make a career decision because my preferences cannot be combined in one career, and I do not want to give any of them up (e.g., I'd like to work as a free-lancer, but I also wish to have a steady income). ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***

Please turn over

For each statement, please circle the number which best describes you.

32)	I find it difficult to make a career decision because my skills and abilities do not match those required by the occupation I am interested in. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
33)	I find it difficult to make a career decision because people who are important to me (such as parents or friends) do not agree with the career options I am considering and/or the career characteristics I desire. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***
34)	I find it difficult to make a career decision because there are contradictions between the recommendations made by different people who are important to me about the career that suits me and about what career characteristics should guide my decisions. ***Does not describe me*** **1 2 3 4 5 6 7 8 9** ***Describes me well***

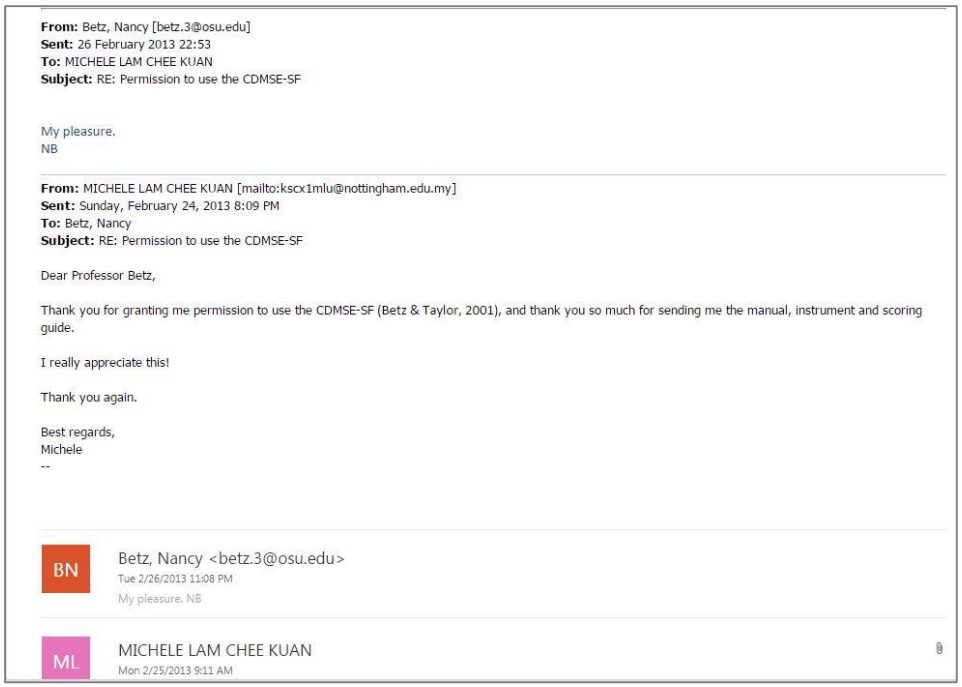
Finally, how would you rate the degree of your difficulty in making a career decision?

Low 1 2 3 4 5 6 7 8 9 ***High***

Thank you!

Appendix B

i) Permission to use the CDSES-SF



From: Betz, Nancy [betz.3@osu.edu]
Sent: 26 February 2013 22:53
To: MICHELE LAM CHEE KUAN
Subject: RE: Permission to use the CDMSE-SF

My pleasure.
NB

From: MICHELE LAM CHEE KUAN [mailto:kscx1mlu@nottingham.edu.my]
Sent: Sunday, February 24, 2013 8:09 PM
To: Betz, Nancy
Subject: RE: Permission to use the CDMSE-SF

Dear Professor Betz,

Thank you for granting me permission to use the CDMSE-SF (Betz & Taylor, 2001), and thank you so much for sending me the manual, instrument and scoring guide.

I really appreciate this!

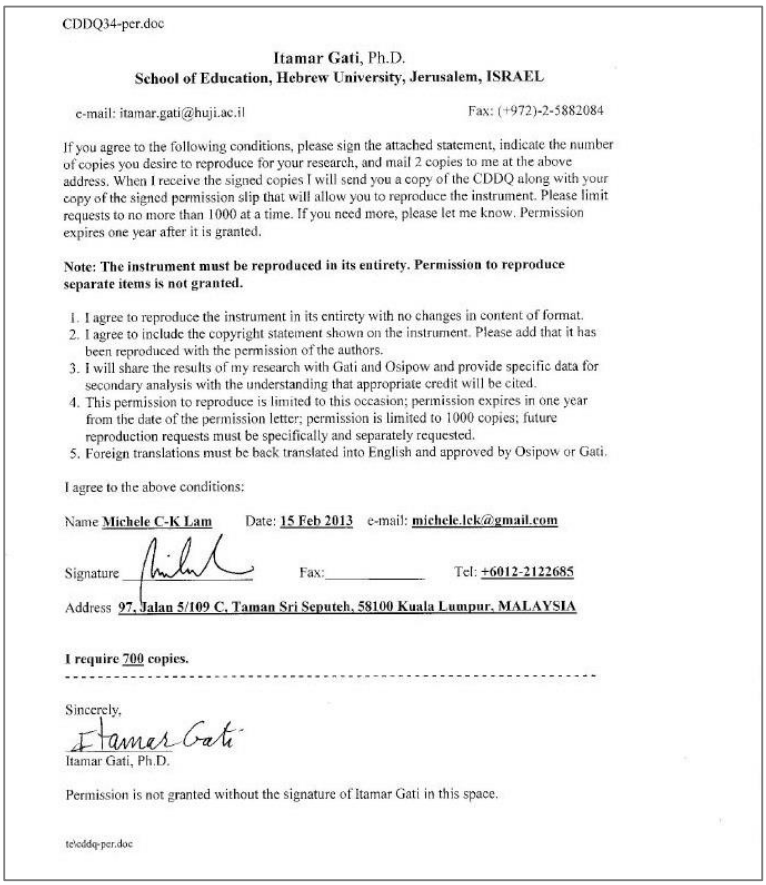
Thank you again.

Best regards,
Michele
--

BN Betz, Nancy <betz.3@osu.edu>
Tue 2/26/2013 11:08 PM
My pleasure. NB

ML MICHELE LAM CHEE KUAN
Mon 2/25/2013 9:11 AM

ii) Permission to use the CDDQr



CDDQ34-per.doc

Itamar Gati, Ph.D.
School of Education, Hebrew University, Jerusalem, ISRAEL

e-mail: itamar.gati@huji.ac.il Fax: (+972)-2-5882084

If you agree to the following conditions, please sign the attached statement, indicate the number of copies you desire to reproduce for your research, and mail 2 copies to me at the above address. When I receive the signed copies I will send you a copy of the CDDQ along with your copy of the signed permission slip that will allow you to reproduce the instrument. Please limit requests to no more than 1000 at a time. If you need more, please let me know. Permission expires one year after it is granted.

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1. I agree to reproduce the instrument in its entirety with no changes in content of format.
2. I agree to include the copyright statement shown on the instrument. Please add that it has been reproduced with the permission of the authors.
3. I will share the results of my research with Gati and Osipow and provide specific data for secondary analysis with the understanding that appropriate credit will be cited.
4. This permission to reproduce is limited to this occasion; permission expires in one year from the date of the permission letter; permission is limited to 1000 copies; future reproduction requests must be specifically and separately requested.
5. Foreign translations must be back translated into English and approved by Osipow or Gati.

I agree to the above conditions:

Name **Michele C-K Lam** Date: **15 Feb 2013** e-mail: **michele.lek@gmail.com**

Signature _____ Fax:_____ Tel: **+6012-2122685**

Address **97, Jalan 5/109 C, Taman Sri Seputeh, 58100 Kuala Lumpur, MALAYSIA**

I require 700 copies.

Sincerely,
Itamar Gati
Itamar Gati, Ph.D.

Permission is not granted without the signature of Itamar Gati in this space.

te\eddq-per.doc

Appendix C

Approval letter from the Research Ethics Committee of the University of Nottingham Malaysia Campus

The University of Nottingham

UNITED KINGDOM · CHINA · MALAYSIA

Michele Lam
Institute of Work Health and Organisations
University of Nottingham Malaysia Campus

Institute of Work, Health and Organisations
The University of Nottingham Malaysia Campus
Jalan Broga 43500
Semenyih, Selangor Darul Ehsan
Malaysia

T: +603 8924 8250
F: +603 8924 8019

30 January 2013

Dear *Michele*

Research Ethics Committee Review

Thank you for submitting your proposal on **Effects of a career course on college students' career indecision, career decision-making self-efficacy and difficulties.** This proposal has now been reviewed by the Ethics Committee to the extent that it is described in your submission.

I am happy to tell you that the Committee has found no problems with your proposal and is able to give approval.

If there are any significant changes or developments in the methods, treatment of data or debriefing of participants, then you are obliged to seek further ethical approval for these changes.

We would remind all researchers of their ethical responsibilities to research participants. The Codes of Practice setting out these responsibilities have been published by the British Psychological Society. If you have any concerns whatsoever during the conduct of your research then you should consult those Codes of Practice and contact the Ethics Committee.

Independently of the Ethics Committee procedures, supervisors also have responsibilities for staff and student safety during projects. Some information can be found in the Safety Office pages of the University web site. Particularly relevant may be:

Section 6 of the *Safety Handbook*, which deal with working away from the University.
http://www.nottingham.ac.uk/safety/
Safety circulars:
Fieldwork on http://www.nottingham.ac.uk/safety/guides.htm#Fieldwork
Overseas travel/work P4/97A on http://www.nottingham.ac.uk/safety/guides.htm#Overseas
Risk assessment on http://www.nottingham.ac.uk/safety/risk-assessment.htm
University Code of Research Conduct and Research Ethics
http://www.nottingham.ac.uk/fabs/rgs/documents/code-of-research-conduct-and-research-ethics-approved-january-2010.pdf

Responsibility for compliance with the University Data Protection Policy and Malaysian Data Protection Act also lies with the project supervisor.

Ethics Committee approval does not alter, replace or remove those responsibilities, nor does it certify that they have been met.

We would remind all researchers of their responsibilities:

- to provide feedback to participants and participant organisations whenever appropriate, and
- to publish research for which ethical approval is given in appropriate academic and professional journals.

Sincerely

Angeli Santos

Angeli Santos, PhD
Director of Studies, Institute of Work, Health and Organisations
On behalf of the Ethics Committee

Appendix D

Student Consent Form

Consent Form

My name is Michele Lam and I am currently pursuing a PhD in Applied Psychology at the University of Nottingham Malaysia Campus. As part of my course, I am conducting research into career decision-making among pre-university students which involves carrying out a career course.

Procedure

You may be invited to participate in two or three of the following:

1. Career course – this involves you attending 2-hour weekly sessions for 4 weeks
2. Survey – this entails you answering a number of questions about your thoughts on career decision-making, which will take about 30 minutes, at 4 different intervals
3. Interview – this involves you answering a few questions in an interview session on the same topic, which will take about 30 minutes.

Voluntary nature of the study

This study will take approximately 3 months from this meeting to the end of the study. The actual career course will take one month. It would be very much appreciated if you could attend all the sessions. However, your participation in this study is entirely voluntary and you may withdraw at any stage. Should you withdraw from the study, any data collected from you will not be used in the project.

Confidentiality

The record of this study will be kept confidential. In any reporting, you will not be identifiable. Only my supervisor, Dr Angeli Santos and I will have access to the raw data. All data collected from you will be destroyed after 7 years.

Contact and questions

If you have any questions at any stage of the study, please do not hesitate to ask me. You will also be given the opportunity to ask questions after the study. For more information, please contact me at kscx1mlu@nottingham.edu.my or +6012-2122685.

Participation

If you agree to participate in this study, please sign and date this form. Your participation is most appreciated.

I have read and understood the above information, and I agree to participate in this study.

_____ _____

Signature of participant Date

Appendix E

A. Student Course Book – sample pages

COURSE BOOK
for
STUDENTS

EFFECTIVE CAREER DECISION-MAKING

Skills for making successful career decisions

Michele C-K Lam, PhD student, University of Nottingham Malaysia Campus

About the course

This course is designed to assist students in making informed and effective decisions that promote their career development. As career development is a life-long process, having the tools and skills to cope effectively with career development tasks such as career decision-making can help ensure both career and life satisfaction.

There are 4 sessions altogether – 2 hours each session for 4 weeks. Each week, there will be activities to complete in class as well as activities to be completed at home. Students are encouraged to attend all 4 sessions and complete all activities to benefit fully from the course.

Course objectives:

- Identify and list top personal values, interests, skills and achievements, and articulate own personality, and work and lifestyle preferences
- Identify relevant career resources that provide information on the world of work
- Explore and identify course and career options based on interests and abilities
- List the steps for selecting goals, and to set personal and academic goals
- Develop an action plan for the future that details steps to achieving the goals set earlier
- Identify the problems in a case study and propose solutions
- Identify obstacles and negative feelings that hinder the decision-making process, and list ways to overcome them.

CONTENTS

Session	Topic	Page
1	My identity and motivation – knowing my values, interests, skills, achievements and personality	3
2	The world of work – finding careers that suit me	8
3	Targets and plans – setting goals and making plans for the future	12
4	Problem-solving and decision-making – developing problem-solving skills for good career decision-making	15

5 key competencies in making good career decisions

1) _____
2) _____
3) _____
4) _____
5) _____

(1) My identity and motivation

Knowing my values, interests, skills, achievements and personality

(a) My personal values

Career decisions are most satisfying when they fit with your personal values. This card sort activity will help you identify and clarify the values that are essential for your well-being.

My top 5 personal values are as follows:

1. _____
2. _____
3. _____
4. _____
5. _____

i. Describe why these values are important to you.

_____
_____
_____
_____
_____
_____
_____
_____

ii. What are some of the careers that interest you at this point?

_____
_____
_____

iii. Reflect on the following questions:

a) Do the above careers allow you to live out your personal values?
b) If not, what course of action do you plan to take?
c) What are some careers that you have not considered but fit with your personal values?

(c) My skills

A skill is the ability to do an activity or a job well, especially because you have practised it through work, study or training, community or recreational activities, or at home. There are generally 3 types of skills: transferable, self-management, and technical skills.

i. What are my skills? Please tick ✓ all that apply

1) *Data and information*
   - ☐ Working with computers
   - ☐ Managing finances
   - ☐ Mathematical
   - ☐ Administration
   - ☐ Planning and organising
   - ☐ Researching and investigating
   - ☐ Analysing
2) *Creative and design*
   - ☐ Artistic and creative
   - ☐ Designing
   - ☐ Performing
3) *Communication*
   - ☐ Writing
   - ☐ Languages
4) *People*
   - ☐ Customer service
   - ☐ Sales and persuading
   - ☐ Motivating
   - ☐ Negotiating
   - ☐ Teaching and instructing
   - ☐ Caring for people
   - ☐ Counselling
   - ☐ Advising
   - ☐ Managing and supervising
   - ☐ Demonstrating and presenting
5) *Practical / technical*
   - ☐ Building and assembling things
   - ☐ Operating vehicles
   - ☐ Food handling and preparation
   - ☐ Repairing and maintaining things
   - ☐ Working with animals
   - ☐ Working with plants
   - ☐ Working with tools, machinery and equipment
   - ☐ Working with your hands
   - ☐ Physical activity
6) *Personal*
   - ☐ Personal management skills
   - ☐ Teamwork

ii. Please give an example for each skill you ticked above

(Activity adapted from "Figure out your skills": http://www.careers.govt.nz/plan-your-career/not-sure-what-to-do/figure-out-what-skills-you-have/)

(d) My achievements

Think about 3 major achievements in your life and list them here

1. _____
2. _____
3. _____

(2) The world of work

Finding careers that suit me

(a) People, environments and lifestyle preferences

1. Describe the characteristics of the people to whom you would like to report

   _____

   _____

2. Describe the characteristics of the people for whom you would like to be responsible

   _____

   _____

3. Describe the people with whom you would like to work

   _____

   _____

4. Describe the environment in which you would like to work

   _____

   _____

5. What level of responsibility do you want in your job?

   _____

   _____

6. What is your ideal salary per month? Per year?

   _____

7. Where would you like to live? Country? Neighbourhood? People?

   _____

   _____

   _____

(b) Work values

i. Select all the values/elements that you would like to have in your job/career

Advancement	Creativity	Fun	Money	Scientific understanding
Aesthetics	Cutting-edge technology	Helping others/ Service	Networking	Security
Authority & power	Diversity	Independence	Passion	Stability
Challenge	Dressing up	Influence	Physical challenge/ outdoors	Status
Competency	Excitement	Intellectual stimulation	Popularity	Structure & predictability
Competition	Fast pace	Leadership	Recognition	Travel
Continuous learning	Flexibility	Legacy	Results	Variety
Co-operation	Freedom	Meeting people	Safety	Work-life balance

ii. My top 10 values/elements

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

iii. Rank the values/elements from most important to least important

1. _____ (most important)
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____ (least important)

(c) Possible careers

List 5 careers that will provide you with the above

1. _____
2. _____
3. _____
4. _____
5. _____

(3) Targets and plans

Setting goals and making plans for the future

(a) Career fantasy

i. In groups of 4, discuss the following questions:

1) Where do you see yourself in the next 5 years? In the next 10 years?
2) What job do you envision yourself doing?
3) Do you work with people, information or things/tools?
4) What are your co-workers like?
5) What kind of neighbourhood do you live in?
6) What did you feel good about at the end of the day?
7) How did this fit with your values? How does it fit with your current dream of the future?
8) Did you imagine yourself in any of the jobs that came up on your career tests?

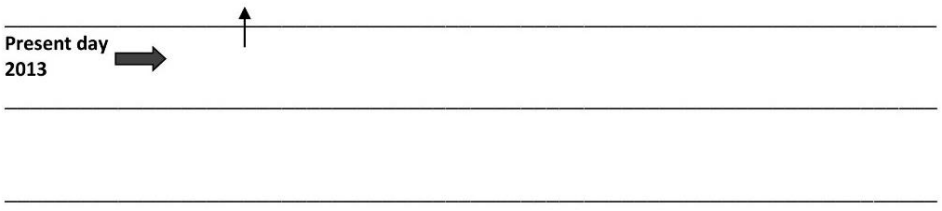
ii. List 3 steps that you can take now to make your career fantasy a reality.

1) _____
2) _____
3) _____

(Activity adapted from the Career Visualisation Exercise in Orientation to Self and Career Curriculum 2007 by Tabitha Grier-Reed, University of Minnesota, Unpublished manuscript, personal communication)

(b) Career timeline

i. Use the lines below to extend your life into the future and indicate any career and life events you anticipate or hope to accomplish. Mark yearly dates and try to be as specific as possible.



ii. Discuss your career timeline with your partner

(Activity adapted from Women's Career Decision-Making Group Manual, Compiled and edited by Kate Roy Sullivan, Boston College, personal communication)

(c) Putting it all together – action planning

i. 5 jobs I want to know more about

1. _____
2. _____
3. _____
4. _____
5. _____

ii. Skills and abilities needed for these jobs

1. _____
2. _____
3. _____
4. _____
5. _____

iii. Education/training/qualifications necessary to get into these jobs

1. _____
2. _____
3. _____
4. _____
5. _____

iv. Short-term goals

1. _____ Deadline _____
2. _____ Deadline _____
3. _____ Deadline _____
4. _____ Deadline _____
5. _____ Deadline _____

v. Long term goals

1. _____
2. _____

(b) Decision-making ideas

In pairs, discuss the following ideas and give reasons for agreeing or disagreeing with them:

1. It is better to avoid making a decision than to make the 'wrong decision.'
2. Career decisions are of life and death importance.
3. A wrong decision is a failure and the consequences will be horrible.
4. If we decide against an option now, it means giving up that option forever.
5. When making a career choice, it is important to please the significant others in life.
6. It is difficult to obtain the skills to do something if you don't already possess them now.
7. Mistakes in the past are controlling actions today.
8. There is one and only one right job for you and true happiness is impossible until it is found.
9. Once a job is accepted, you are committed to it even if it becomes boring and dissatisfying.
10. A career path can or must meet all of your needs and utilise all of your abilities.
11. Happiness on the job will be determined by forces beyond your control (ie other people, institutional policies).
12. If you really had your head together, by now you would know exactly what you want to do when you grow up.
13. If you have a disability, your career choices are limited.

(Adapted from Women's Career Decision-Making Group Manual, Compiled and edited by Kate Roy Sullivan, Boston College, personal communication)

(i) Are there any negative or self-defeating thoughts that you need to overcome?

_____

_____

(ii) What are the steps that you could to take to overcome them?

_____

_____

ii. Finding a mentor

Suggest a few people who can be your mentor here.

1. _____
2. _____
3. _____
4. _____
5. _____

REFLECTION

(a) Review the lessons and activities that you have completed over the last 4 weeks. Describe the most important lesson that you have learned in each topic.

1) My identity and motivation

_____

_____

2) The world of work

_____

_____

3) Targets and plans

_____

_____

4) Problem-solving and decision-making

_____

_____

(b) Are there any areas in your life concerning career decision-making in which you need to make changes? What are some of the things that you need to do from now onwards?

_____

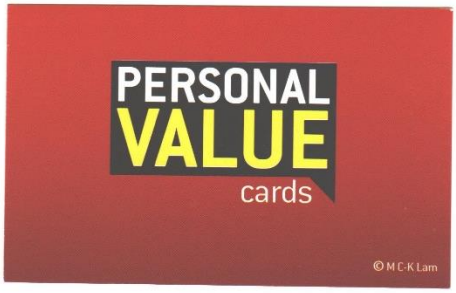
_____

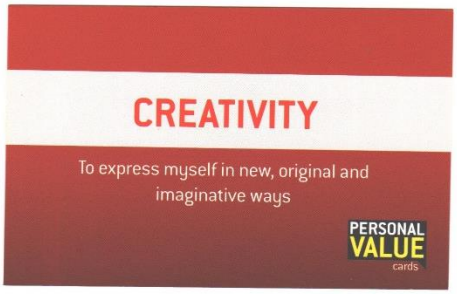
_____

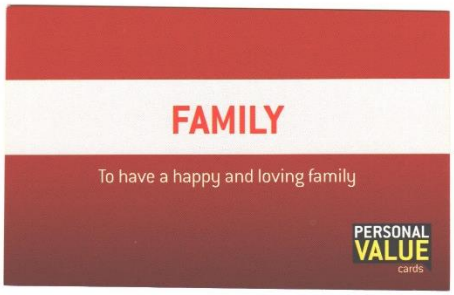
_____

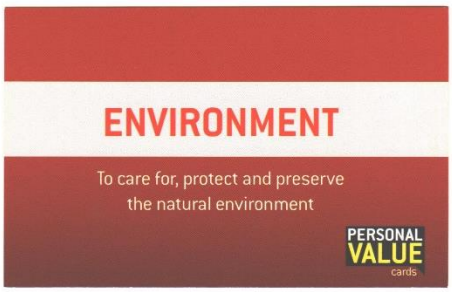
_____

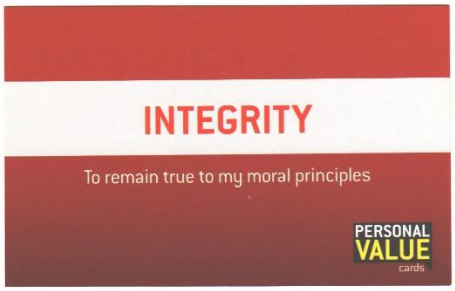
B. Personal value cards – some samples

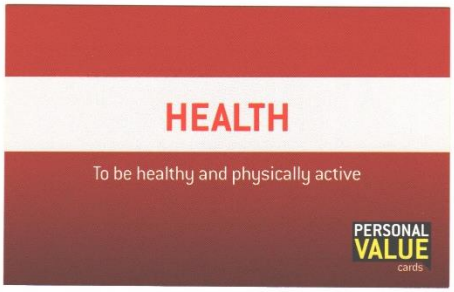


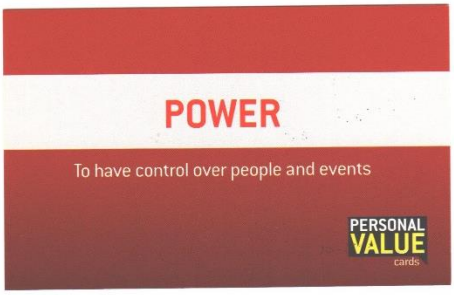


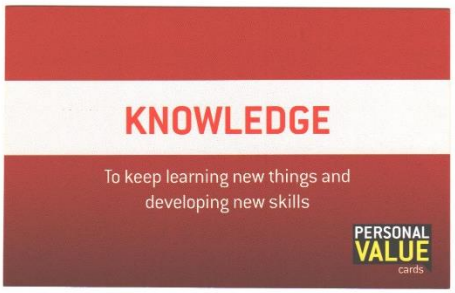












C. Handout on role models – an excerpt

Temple Grandin – autism and animal welfare activist

Temple Grandin was born in Boston, Massachusetts, on 29 August 1947. Grandin earned a doctorate despite her autism, and has employed her special sensitivities as an animal welfare consultant and philosopher. She has published her insights on autism and animal rights in books, including *Animals in Translation*, *Animals Make Us Human* and a memoir entitled *Thinking in Pictures*.

Temple Grandin was born to parents Richard Grandin and Eustacia Cutler in Boston, Massachusetts. At the age of 2, Grandin was diagnosed with autism, considered a form of brain damage at the time. Cutler, initially blamed by physicians for her daughter's condition, worked tirelessly to find the best care and instruction for Grandin. Her treatments included extensive speech therapy, which helped to draw out and reinforce Grandin's communicative abilities.

Grandin began to speak at the age of 4. Although her parents sought the best possible teachers, social interactions remained difficult in middle and high school, where other students teased Grandin regularly for her verbal tics.

Despite these difficulties, Grandin achieved considerable academic success. She earned a degree in psychology from Franklin Pierce College in 1970, followed by a Master's degree in animal science from Arizona State University and a doctoral degree in animal science from the University of Illinois at Urbana-Champaign. She then worked as a consultant to companies with large animal slaughterhouse operations, advising them on ways of improving the quality of life of their cattle.

Grandin became nationally known after appearing in Oliver Sacks's 1995 book, *An Anthropologist on Mars*, the title of which is derived from Grandin's description of how she feels in social settings. By that time, she had already made a name for herself in autism advocacy circles. Grandin first spoke publicly about autism in the 1980s, at the request of one of the founders of the Autism Society of America.

In addition to autism advocacy, Grandin is well known for her work regarding animal welfare, neurology and philosophy. In the essay "Animals Are Not Things," Grandin argues that while animals are technically property in our society, the law ultimately grants them certain key protections. Her books, including *Animals in Translation* and *Animals Make Us Human*, have garnered critical acclaim.

Grandin's willingness to work with fast-food companies and other slaughterhouse owners is controversial within the animal rights community. In her books, Grandin makes the case that the alleviation of anxiety, rather than the maximum extension of life, should be the priority for those keeping any animals. She notes the high degree of anxiety suffered by domestic animals left for long periods of time without human or animal interaction as an example of the ways in which animal welfare is neglected outside of the slaughterhouse.

(Page 1 of 2)

Appendix F

Manual for Instructors – sample pages

MANUAL
for
INSTRUCTORS

EFFECTIVE CAREER DECISION-MAKING

Skills for making successful career decisions

Michele C-K Lam, PhD student, University of Nottingham Malaysia Campus

Manual for conducting the career decision-making course with college students

Contents

I	About the course a. Course description and background b. Course objectives c. Course contents d. Methods e. Materials f. Evaluation	2-4
II	Instructors' responsibilities	5
III	Session outline	
	A. Introduction & briefing	6
	B. Session 1	7
	C. Session 2	9
	D. Session 3	11
	E. Session 4	13
	F. Follow-up session	15
IV	References	16

INSTRUCTORS' RESPONSIBILITIES

a. General responsibilities

1) Encourage active participation in all activities
2) Provide constructive feedback, motivation and encouragement
3) Promote self-reflection and career exploratory behaviour
4) Counter self-defeating and negative thoughts and beliefs
5) Model appropriate behaviour
6) Maintain a positive outlook

b. Other tasks

1) Prepare posters/flyers to promote introductory sessions and/or course
2) Conduct introductory sessions to encourage students to participate
3) Prepare timetable for sessions and remind students of date, time and venue
4) Prepare powerpoint or prezi presentations for each session according to the topic and activities
5) Prepare attendance list and take attendance at the beginning of each class; and collect attendance sheet at the end of the session
6) Conduct each of the 6 sessions of the course
7) Hand out and collect questionnaire packets
8) Read the manual and follow the instructions provided for each activity (early preparation and planning are necessary)
9) Manage group and individual activities
10) Make photocopies of materials needed in class
11) Remind students of take-home activities
12) Review take-home activities and provide feedback
13) Remind students to make an appointment to see the instructor for feedback on their self-assessment results and if they have other career-related questions
14) Email students a summary of the session and provide a preview of the next session

Note: Students may have other extracurricular activities that conflict with the sessions as they progress in the semester so it is essential to emphasise the importance of attending all four sessions at each session.

Session 1 – My identity and motivation (2 hours/120 mins)

Materials needed: prezi presentation, laptop and projector, questionnaire booklets, small pieces of paper (one each per student), course books for students, personal value cards.

Bandura's sources of information on which self-efficacy is modified to emphasise in this session: performance accomplishments and verbal persuasion.

Prezi presentation should include the following:

a) Brief profile of instructor
b) Structure and schedule for course
c) Expectations and ground rules
d) Instructions for ice-breaker activity (optional)
e) Key competencies in making career decisions
f) Personal values
g) Career genogram

1. Welcome students to the course; re-introduce yourself and affirm the purpose of the course. (5 mins)

2. Hand out questionnaire packets and collect questionnaire packets. (30 mins)

3. Explain structure of course and expectations, and reiterate benefits of the course – state ground rules for course; encourage students to commit to attending all sessions, participate actively in class, and to do all the activities during and after class. (5 mins)

4. Ice-breaker activity (optional) – give out a small piece of paper to each student to write his or her name on it. Collect the pieces of paper and give them out randomly. Without saying a word, students are to look for the student with the name on the piece of paper given to them. Once everyone has done so, they can either form pairs, small circles or one large circle (depending on how the names were distributed among students). Each student needs to introduce the student on their left (eg what course they plan to take or their career aspirations). Students take back the paper with their own names on it. (10 mins)

5. On the back of the paper, ask students to write ONE goal that they would like to achieve at the end of the course, and how much time they are willing to set aside to achieve this goal. Ask students to paste this paper somewhere in their homes that they can see frequently to motivate themselves to spend the necessary time and effort in order to achieve their goal. (5 mins)

6. Review the 5 key competencies in making good career decisions
    a. accurate self-appraisal
    b. gathering occupational information
    c. goal selection
    d. making plans for the future

e. problem-solving.

Explain that career indecision is a normal developmental phase that students go through as they make decisions. In order to make good decisions, students need to invest the necessary time and effort (5 mins)

7. Distribute student course books.

8. Ask students to complete page 2 and invite volunteers to share their definition of a career and why a career is important to them. (5 mins)

9. Personal values card-sort activity – explain what personal values are; give instructions on how to use the personal value cards. Do the activities on pages 3 (15 mins)

10. Discuss and complete the activities on interests, skills, and achievements on pages 4-5. (20 mins)

11. Discuss the career genogram (an activity to explore occupational stereotyping and a multigenerational history of family careers). Tell students that in exploring our identity and motivation, it's important to remember that family (especially in Asian cultures) plays a salient role in our lives and that we may be influenced by factors and legacies that are outside of our awareness. Therefore, by exploring our family background and personal histories, we will gain an insight into these influences. (15 mins) (If students are unable to complete the career genogram, they can do it at home)

12. Take-home activity: Students need to complete the online Jung Typology Test to obtain their type. They need to read the description of the type before completing the exercises on page 7. They should also explore the career choices suggested by the humanmetrics website based on their type and complete exercise (g) on page 7. (5 mins)

13. Inform students of the schedule to consult personally with the instructor for a discussion on their personality type and other questions about careers that they may have. This schedule will be emailed to them and they need to make an appointment to see the instructor.

14. Closing: Ask if students have any questions based on this session. Briefly preview Session 2 (eg, We'll be looking at the world of work, and you'll be exploring the people, environments, lifestyle preferences, work values, and talking about accessing information on jobs). Remind students of the date, time and venue for next session. (5 mins)

15. Stress the importance of coming for the next session.

Session 2 – The world of work (2 hours/120 mins)

Materials needed: prezi presentation, laptop and projector, Self-Directed Search (SDS) Assessment Booklet and Occupations Finder.

Bandura's sources of information on which self-efficacy is modified to emphasise in this session: vicarious experiences and verbal persuasion.

Prezi presentation should include the following:

a) What are career assessments and their purpose
b) People, environments and lifestyle preferences
c) Work values
d) Resources for job search, including actual websites and publications

1. Review take-home activity. Briefly review personality types. (5 mins)

2. Introduce career assessments and their purpose, distribute the SDS and explain how to do it. Discuss the results. (45 mins)

3. People, environments and lifestyle preferences, page 8. (10 mins)
    a. Co-workers can be bosses, managers, supervisors, team members and clients/patients/students
    b. For work environment you can consider the location (indoors/outdoors, office building, house, in one location or many that require travelling, city/town/suburbs etc), work space (a work station/private room, hospital, shopping mall, holiday resort, a classroom etc), physical conditions (fancy, homey, comfortable etc), atmosphere (noisy/quiet, formal/casual) size/type of business (large/small, MNC/locally owned, your own business, for profit/not for profit), dress code (formal/casual, a uniform, jeans and t-shirt, a lab coat, whatever you want to wear)
    c. Level of responsibility (also level of stress) – an employee, supervisor, manager, business owner
    d. Lifestyle preferences – the amount of money we make will to a large extend determine the lifestyle we can lead

4. Work values – besides personal values, there may be elements that you would like to see in your career. Do the activities on pages 9 (10 mins)

5. Discuss resources for job search and information on salary. Ask students to suggest other sources of information and complete page 10. (5 mins)

6. Introduce speaker who will share his or her career decision-making journey. Students are to pay close attention to the sharing and answer the questions on page 11. If a speaker cannot be found, to play a video interview of a successful professional or an inspirational figure who have overcome obstacles to achieve success. (30 mins)

Session 3 – Targets and plans (2 hours/120 mins)

Materials needed: prezi presentation, laptop and projector

Bandura's sources of information on which self-efficacy is modified to emphasise in this session: performance accomplishments and verbal persuasion.

Prezi presentation should include the following:

a) Career timeline – provide examples
b) Definition of goal and target, and types
c) Career decision-making process and review the 5 key competencies
d) Going to university – advantages and disadvantages
e) Personal statement – elements and samples

1. Career fantasy (15 mins)

i. Read the following:

We are going to journey into the future – ten years from now. I want everyone to begin by closing your eyes. Keep them closed even if you have a hard time fantasizing. Now let yourself relax. Feel the tension flowing out your body. Breathe in deeply. Hold it. Exhale. Let yourself get comfortable. Let your imagination go free.

It is ten years into the future. The year is 2023. You wake up. What time is it? Who's there? What is your place like? You look in your wardrobe to select an outfit for work. What do you choose? A business suit, something smart but casual, or comfortable clothes like t-shirt and jeans? Do you look forward to going to work? Do you feel excited? Apprehensive? Bored?

It's nearly time to go to work, or perhaps you'll be staying home to work. If you leave for work, notice how you get there. You step outside your front door, what do you see? Buildings, space, houses? How far do you travel to work? What do you take with you? If you work at home, what do you do?

You are now at work. What does the building look like? You walk in, who is there? Does a receptionist greet you? What does your workplace look like? Do you have your own office? What is there? What is the first thing on your to-do list? Try to form an image of the specific tasks you perform while working. Are you working with your hands, adding figures, attending meetings, talking to people? What are you co-workers like? What are they doing?

Now it is time for lunch. Do you stay in or go out for lunch? Who do you eat lunch with? What do you eat for lunch? Is this lunch like your usual one or different? When you come back to finish up your work for the day, what is the first thing on your to-do list? What is the last thing you do before you get ready to stop work for the day.

Leave your work place and go to where you live. What do you notice along the way? What does your living place look like? After your evening meal, what do you do? Is anyone with you?

Session 4 – Problem-solving and decision-making (2 hours/120 mins)

Materials needed: prezi presentation, laptop and projector, handout on role models, questionnaire booklets.

Bandura's sources of information on which self-efficacy is modified to emphasise in this session: physiological & emotional states, and verbal persuasion.

Prezi presentation should include the following:

a) Case study
b) Problem-solving process; steps or strategies to solve problems; barriers to problem-solving
c) Career decision-making ideas – show the positive side of each statement
d) Role models – what makes a role model
e) Getting support – show why it's important to get parental support for our career decisions
f) Review all 4 lessons and actions students can take as a follow-up.

1. Collect Personal Statement.

2. Read the case study on the prezi and ask students to get into groups of four to discuss the answers to the two questions: 1) What is the problem? 2) What are some ways to solve the problem? Summarise by highlighting the main points: how did they solve the problems – what strategies did they use (trial & error, past experience, etc), from whom did they seek help. (20 mins)

3. Discuss the problem-solving process/cycle in the diagram shown on page 15, and allow students to answer the questions that follow. (5 mins)

4. Discuss some barriers to decision-making – ask students to volunteer problems commonly faced by students in pre-university. Eg studies, friends, family, extracurricular activities, making course/career decisions etc. Then ask students to suggest ways to solve these problems and share some examples of problem-solving in their own lives. (5 mins)

5. Ask students to get in pairs to discuss career decision-making ideas and do the activity on page 16. Discuss this as a big group. The instructor should de-bunk myths and correct misconceptions regarding career decision-making during this activity in the most positive and encouraging manner. (20 mins)

6. Distribute handout on role models. There are 8 role models (4 men and 4 women). Ask students to read the handout, and get into groups of 4 to discuss the questions. After that, they need to nominate a representative from their group to summarise their discussion and present to the class. (20 mins).

Appendix G

Sample responses from students in the feedback forms and email interviews.

A. Feedback forms

1) "What are some of the lessons you learned in the course?"

'There is no one perfect career – there could be a few'

'I have to change the way I view making career decisions, and improve my own abilities'

'Career decisions are not something to be too fearful or worried about'

'A wrong decision isn't the end of the world'

'I learned to look at career decisions from a different perspective'

'You are not stuck with a career for life – you can change careers if you are not satisfied'

'Goals should be clear and written down'

'We need to set goals in our lives'

'A clear goal and a plan is vital in making a decision'

'Do my research: target and plan'

'Make realistic goals'

'You need to understand yourself before others can help you'

'Understanding myself better and learning to always have a positive mindset in all I do'

'I learned more about myself and my current situation (and understand why I can't make a career decision before this), therefore I know how to move forward.'

'I know my personal values and personality well'

2) "What other topics would you like covered in the course?"

- Information related to universities: entry requirements, applications and university life
- Information on different or lesser known jobs and courses
- Information related to financial aid

- Self-improvement topics like time management, how to be motivated to act
- Getting support from parents with opposing views
- Interview skills and job hunting tips

3) "How can this course be improved?"

- Shorter sessions but more frequent
- Notes for students on topics that are not included in the course book
- More physical activities that make students move around in the class instead of being seated throughout
- More time to ask questions and discuss issues in groups
- More interaction
- More scholarship information
- More in-depth discussion about role models
- Provide contacts of people in various careers that we can talk to
- Include group counselling sessions

B. Email interviews

1) "There are five key competencies in making career decisions: self-appraisal, goal selection, gathering occupational information, planning and problem-solving. Did your confidence in any of these key competencies increase after the course? Please explain."

'My confidence in self-appraisal increased after doing personality quizzes. Goal-setting, planning and problem-solving became easier after I became educated on how to set goals through this course. As for gathering occupational information, after the course, I learned the methods to obtain relevant information online and through fairs.'

'Yes, I have already set a few goals that I want to achieve in my mind. I have also set a few plans for my future and I managed to solve my personal struggles on making my own career decisions.'

'Yes, especially gathering occupational information, planning and problem solving. I had to contact people myself and plan visits to hospital just so I can get an exposure on what being a doctor is like.'

'In planning and problem solving. Through the course, I understand my weaknesses and the skill requirements for an engineer so I am trying my best to overcome my weak spots and develop those skills.'

'Yes, it increased after doing research about the career for example researching about the occupational information.'

‘Yes, particularly in goal-setting. I have started to take more initiative in setting small goals along the process of achieving my ideal career, such as aiming to ace subjects relevant to my career choice and participating in workshops.’

‘I have learned a few things in each of the five areas but the one I’ve significantly gained more confidence in is gathering occupational information. With the various resources given and also the idea of speaking to friends who are already in the field.’

‘Self-appraisal never occurred to me before as I was always compared to someone else and I had to handle a lot of competition, somehow going into depression now and then. But I have come to cut myself some slack now. I found out that a goal shouldn’t be set for something in the far future, rather small achievable ones that lets me go through self-discovery. I have a better view now on what occupations are out there. And I am better at keeping calm at solving problems now than before when I break down easily.’

‘Yes I have. In self-appraisal, I found the personal value cards to be a useful reminder to myself. I have also chosen my goal and am striding towards it. Currently, I am still at the gathering occupational information, planning and problem solving stage. I believe this part cannot be rushed. I believe I will gain more confidence in my career decision after my two weeks of clinical attachment.’

‘Planning and problem solving. I know what to eliminate and what to put extra attention in terms of making decisions.’

‘This course has boosted my confidence level in goal setting as I managed to set short term and long term goals. Also, my confidence level has increased for problem solving as I managed to identify problems in preventing me making my career decisions and later overcoming it.’

‘I feel that my confidence in accurate self-appraisal has increased. I have a better understanding of myself (my personal values, abilities, personalities, preferred lifestyle) after this course (and the course book) guided me to think them through.’

‘Self-appraisal: I am able to see a little more clearly on what I want in my life. Goal-setting: I know what is needed in order to set a clear goal.’

‘Planning and problem solving: I'm more confident in determining the key points required to plan or to solve a problem as well as thinking up the steps to overcome them.’

‘Problem solving. I try to look at the problem further and then find a solution to it rather than just give up. When I have trouble deciding whether I should change my decision, I will look at all aspects to decide.’
‘The goal-setting part of the course was very interesting as I've never sat down and thought so far into the future. The course as a whole helped me analyse

myself and decide what qualities I had, what I valued and what I would look for in a job.'

2) **"If you have not made a career or course decision, what is preventing you from making a decision?"**

'Lack of confidence in myself.'

'I'm still unsure if what I choose will be something that I will be able to do well and consistently without fail.'

'I have no idea what I'm good at.'

'Not sure which career suits me.'

'I feel that I would need to explore more and start applying all the strengths I have.'

'I am interested in more than one area, thus I feel that I would need to keep my options open.'

'Actually what I really wanted to do was to become a librarian. However, the salary would be much too low. And since I thought I like doing math, I might as well listen to what my parents advised me to do which is to be an accountant.'

'My results are not good for now. I'm not sure my result will help me get into the course I want.'

3) **"If you have made a career or course decision, what were some of the career decision-making difficulties that you overcame?"**

'I overcame the thought that studying and practising law would lead to a terrible life as I have come to believe that other careers can be equally challenging.'

'I have become more confident in choosing the career of my choice…. I now realise that not everyone is perfect and if I believe in myself, I would be able to chase after my dream.'

'I am now confident that with passion and determination, I am able to achieve a great future.'
'Gathering information and making the decision.'

'Learning about the true nature of the career market.'

'Finding out what I really want to be.'

'Deciding on where to further my studies and which university is the best one for me.'

‘I have been able to reflect on my core values and how they will be put to good use in my career choice, thus giving me a solid anchor that allows me to answer questions on my career choice.

‘Definitely the confusion of the range of courses. The personality tests really helped as well to give me a glance of what kind of person I am.’

‘Fear of not being able to find a job in the future in the field in which I’m interested and financial problems.’